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ABSTRACT

The second part of a study of educational outcomes for high school students in Pennsylvania collected data from a statewide randomly selected sample of 3,364 members of the business and industrial community; a mailed survey yielded 749 usable returns (22 percent). Data analysis included an inspection of survey demographics, a review of descriptive statistics on the ratings of the educational outcome statements, and a factor analysis of the outcome statement ratings. The business survey showed high levels of congruence with the educators' survey in part one of the study in the importance of five factor groupings: technical skills, job search skills, occupational survival skills, and in a combination of basic and higher order skills. Findings were as follows: (1) business/industry members and educators have similar opinions about what students should know and be able to do to graduate from high school; (2) business/industry members and educators have similar opinions about the priority of outcomes; and (3) the content of the five factors (technical skills, job search skills, occupational survival skills, basic skills, and higher order skills) was congruent with the content of five factors identified by educators in the first part of the study and similar to the content of factors identified in a study conducted in Illinois. (Contains testimony to the Pennsylvania House Education Committee, 26 references, and both survey instruments.) (KC)

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The Center for Vocational Education
Professional Personnel Development

ED 403 444

An Investigation of Opinions Toward Selected Educational Outcomes

Part 2: Business and Industry in Pennsylvania

by

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AN INVESTIGATION OF OPINIONS TOWARD SELECTED EDUCATIONAL OUTCOMES PART 2: BUSINESS AND INDUSTRY IN PENNSYLVANIA

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The opinions expressed in this monograph are solely the views of the authors and do not reflect official endorsement by any agency or institution.

Abstract

**An Investigation of Opinions
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Part 2: Business and Industry in Pennsylvania**

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December 1996

The Temple University Center for Vocational Education Professional Personnel Development conducted a two-part survey research study to gain more knowledge about educational outcomes for high school students in Pennsylvania. Part one of the investigation surveyed educators (N = 1,089) from school districts and Area Vocational-Technical Schools in the eastern region of the State, and part two queried employers and business persons from across the Commonwealth. Both surveys sought to assess opinions on what students should know and be able to do as a result of secondary schooling. The questionnaire used in both parts of the study (The Educational Outcome Survey), was based on an adaptation of one used by Barnard and Wentling (1985) to identify learning outcomes for education for work programs in Illinois.

This monograph focuses on part two of the research, the opinions on educational outcomes by personnel from business and industry. Data were collected

from a statewide randomly selected sample of 3,364 members of the business and industrial community identified by the Bureau of Research and Statistics, Employment Security Section, Pennsylvania Department of Labor and Industry. A modified version of the Educational Outcome Survey instrument used with the educators in the part one investigation was used to survey the business participants. From a mailed survey, the number of usable returns was 749, which represented a return rate of 22.3%.

Data analysis included an inspection of survey demographics, a review of descriptive statistics on the ratings of the educational outcome statements, and a factor analysis of the outcome statement ratings. The demographic profile of the respondents was consistent with the proportional distribution of business and industry size in Pennsylvania, as well as by regional location. Data collected were, therefore, considered to be representative.

An inspection of mean ratings and rank-order listings of the outcome statements was also conducted, and compared to the part one findings. The top range mean ratings of outcome statements was essentially the same for the respondents from business and industry ($\underline{M}$ = 3.90) and education ($\underline{M}$ 3.91). The low end ratings, however, were approximately 20 % lower by the business and industry group ($\underline{M}$ = 2.59) than the educators ($\underline{M}$ = 3.02). The composition of the top 10 and bottom 10 rank-order listing of outcome statements by the two groups were essentially the same.

Of significance are the levels of congruence between the factor analyses of outcome statement ratings for the educators and the business persons. Through

inspection there were high levels of congruence in five factor groupings: Technical Skills, Job Search Skills, Occupational Survival Skills, and in a combination of Basic and Higher Order Skills. In addition, the high level of factor congruence prevailed in a comparison made with a related piece of educational outcomes research conducted in Illinois (Barnard & Wentling, 1987). The similarity in factor composition between the Illinois and Pennsylvania studies is important because it lends empirical support to the recommendations of several educational and industrial commissions around the country regarding educational reform and restructuring (see, for example, "America's Choice: High Skills or Low Wages", (Commission on the Skills of the American Workforce, 1990) "What Work Requires of Schools", (U.S. Dept. of Labor-SCANS, 1991) and "America 2000: An Education Strategy", (U.S. Department of Education, 1991).

The findings from this research provided a foundation for testimony presented to the Pennsylvania State Board of Education and the Pennsylvania House Committee on Education. The testimony served as a significant influence to the eventual adoption of a technical skill student learning outcome in the 1993 revision of the Pennsylvania School Code.

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CHAPTER I

INTRODUCTION

BACKGROUND

The campaign for school reform which began in the 1980s did not end at the close of the decade. In fact, as we continue through the 1990s, the campaign has widened in scope, and gained in momentum. Furthermore, it is likely to continue until a satisfactory level of change has occurred in the nation's schools.

The school reform literature of the eighties provides an overview of the concerns that led to the crusade for educational reform. Perhaps most significant in creating an early awareness of the need to improve schools on a national level was the 1983 report of the National Commission on Excellence in Education, "A Nation at Risk". The opening sentence of this landmark report communicated the severity of the problem by stating that, "The educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a nation and a people." (p.1). The plethora of reports that followed provided additional focus on this topic, as well as additional points of reference.

The voices of U.S. businesses and industries have been among the most vocal in calls for education reform. Their major concern is about the increasing shortages of qualified, skilled workers which was outlined in, "A Nation at Work: Education and the Private Sector." The report sighted the failure of schools to update curricula with advances in technology and new workplace skill requirements (National Advisory

Council on Vocational Education and the National Alliance of Business, Inc., 1984).

Similarly, Parnell (1985) expressed concerns about the employment and education needs of the large segment of secondary school students who are not among the academic top 25%, and who are not enrolled in college preparation programs. Parnell developed a case supporting the need for (a) curricular change at the secondary school level and (b) increased articulation between high schools and community colleges to prepare students for technical fields and better serve the needs of the neglected students and the nation.

More widespread reform of education for career bound students was strongly called for in yet another report of the 1980s, "The Forgotten Half: Non-college Youth in America", (Youth and America's Future: The William T. Grant Foundation Commission on Work, Family and Citizenship, 1988). The Commission reported that, "If a large percentage of our young people are left to flounder in low-paid, futureless jobs, we face a nation divided between the educated and prosperous and the uneducated and under-employed" (p.7).

Suggestions for comprehensive reform were offered to educators, employers, families, governments as well as various elements of communities to better serve the education for employment needs of our nation's youth.

The collective utility of these reports from the 1980s is that they have focused on a problem in American education that has gone unnoticed and/or ignored for quite some time, in the hope that it would somehow go away, or not extend itself into other aspects of society beyond the school.

Neither of these two possibilities has occurred; that is, the problem has not gone away, and it is extending to other aspects of our society. The 1990s is proving to be a time for accepting these problems as a stark reality and moving on to provide solutions.

Three national reports developed in the early 1990s stand out as potentially pivotal in the development of an agenda for educational change to correct the problems recognized during the previous decade: These include: "America's Choice: High Skills or Low Wages", (Commission on the Skills of the American Workforce, 1990) "What Work Requires of Schools", (U.S. Dept. of Labor-SCANS, 1991) and "America 2000: An Education Strategy", U.S. Department of Education, 1991) which was advanced as a national strategy by President Bush. Directed toward a national audience, these reports can be characterized as sharing three common elements. First, they all provide some level of recognition of America's economic difficulty on the domestic and international scenes, a dilemma that will be exacerbated if the issue of workforce preparation is not addressed in a timely fashion. Second, they agree that the optimal solution to workforce preparation will most likely be achieved at the local community level. Third, they agree that workforce preparation to be competitive and world class, must be linked to high standards of educational achievement (Boston Regional Office of the Employment and Training Administration, U.S. Department of Labor, 1992).

Efforts to respond to the needs of educational reform and effective work force preparation were already taking shape at a time parallel to the development of many

of these reports. Foremost among these, at the national level, is the Carl D. Perkin's Vocational and Applied Technology Education Act of 1990, P.L. 101-392, which will remain in effect for five years and serve as an influence to secondary, post-secondary and adult education programs. According to John F. Jennings (1991), General Council for Education to the U.S. House of Representatives Committee on Education during the drafting of the legislation that reauthorized the Perkins Act, this new statute will place vocational education in a leadership position and help correct some of the educational problems of the 1980s by:

1. Integrating academic and vocational education programs.
2. Identifying and funding programs that produce desired results.
3. Developing "2 plus 2" linkage programs and related technical programs at the post-secondary level.
4. Emphasizing programs that serve the poor and disadvantaged.

Other significant change efforts are also noted on the regional and state level.

Regional and State Efforts for Educational Reform

A regional effort at school reform was formed in 1987 by the Southern Regional Education Consortium which targeted changes in vocational education. Originally formed with thirteen states, the consortium has grown to sixteen with Pennsylvania being the most recent addition joining in June 1991. According to Gene Bottoms, the Consortium Director, the mission of the consortium has been consistently maintained

since it's inception. Because of this, significant gains in vocational education student test scores for competencies in the areas of communication, mathematics and science have been recorded in all of the thirty plus program pilot sites which have been using consortium developed strategies and recommend curriculum materials. (Bottoms, 1989; personal communication, July 25, 1991).

Pennsylvania's recent membership in the consortium is consistent with its involvement with educational change. For example, the Commonwealth has expressed a statutory interest in outcome-based education through the Goals of Quality Education, which were first proposed by the State Department of Education more than 25 years ago. Further, it is clear that public school curricula will undergo changes in order to comply with the revision of Chapters 3, 5, and 6 of the Pennsylvania State Code as well as through the mandated strategic planning requirements of local school districts which became law in Pennsylvania in 1993.

A Direction Toward Quality

The inclusion of the quality goals of education, in two different forms, has been an element of State statutes in the Commonwealth and since the mid-1960s, their continued presence and level of influence are likely to extend into the next century. According to the State Board of Education, Pennsylvania is going to shift the focus of state regulations from input measures to student achievement based on learning

outcomes, (Principles Guiding the Development of Regulations on Curriculum, Vocational Education, and Student Assessment, 1991). Furthermore,

> State regulations should facilitate a restructuring of the public schools so that all involved focus our principal efforts on establishing and achieving learning outcomes for children, based on the Goals of Quality Education, that will prepare them for successful adulthood in the twenty-first century. (p. 5)

The goals have been defined by the State Board "...as desirable outcomes of instruction in the areas of Communication Skills, Mathematics, Science and Technology, Citizenship, Arts and Humanities, Analytical Thinking, Family Living, Work, Health, the Environment, Self-Esteem and Understanding Others." (p. 19).

The Twelve Goals of Quality Education, an expanded and more measurable revision of the 1965 Ten Goals of Quality Education, were adopted by the State Board following a five year review in 1979. And, an updated and slightly expanded set of quality goals was introduced into the code in 1992. The categories of the most recently enacted goals include communications, mathematics, science and technology, environment and ecology, citizenship, appreciating and understanding others, arts and humanities, career education and work, wellness and fitness and personal, family and community living. Supporting outcomes to these goals have been under development and the subject of great controversy since they were initially proposed by the State School Board in 1991. At this time, the form and future of any of the proposed educational outcomes remaining as a final component of the most recent code revision effort is uncertain. Stimulated by the atmosphere surrounding the call for educational

change and the review process associated with the revision of the Pennsylvania School Code, a two part research effort was undertaken at Temple University through The Center for Vocational Education Professional Personnel Development.

Research: Part One

The first part of the investigation involved the assessment of opinions of educators in eastern Pennsylvania toward student learning outcomes at the high school level. To facilitate data collection, an Educational Outcome Survey Instrument was developed to (a) study opinions associated with the educational outcomes students must know and/or be able to do in order to graduate from high school and (b) study opinions associated with various possible academic and vocational program/course delivery configurations which would be used for the achievement of educational outcomes.

The following research questions were addressed in the first part of this study:

1. What is the educational role and subject specialization of the respondents who have completed the educational outcome survey?
2. What is the difference between the degree of emphasis ratings given to the 66 educational outcome statements and the educational role and subject specialization of the respondents?
3. What is the difference between the course/program delivery configurations chosen for each of 66 educational outcome statements and the educational role and subject specialization of the respondents?

4. To what degree will the ratings given to the 66 educational outcome statements load in the factors derived from the Twelve Quality Goals of Education? How will this vary due to educational role and subject specialization of the respondents?

Data were collected from Area Vocational Technical Schools (AVTSs) and feeder Comprehensive High Schools (CHS) in eastern Pennsylvania (total N = 2, 138). The number of usable returns was 1,089 with a return rate of 51%.

Data were subjected to three different statistical tests. The results of the factor analysis yielded nine factor groupings from the 66 outcome statements in the research instrument. Through a review of the factor constructs, the following factor titles were assigned: Factor 1--General Academic Skills, Factor 2--Technical Skills, Factor 3--Occupational Survival Skills, Factor 4--Job Search Skills, Factor 5--Affective Job Skills, Factor 6--Basic Skills, Factor 7--Higher Order Skills, Factor 8--Entrepreneurial Skills, Factor 9--Not Named.

An analysis of degree of emphasis ratings given to educational outcome statements was conducted through an examination of mean ratings and through the use of a Mann-Whitney U Test. The degree of emphasis ratings given to vocational or career related outcome statements by AVTS respondents were higher than the ratings to the same outcome statements by CHS respondents. Conversely, the degree of emphasis ratings given to the more academic related outcome statements by CHS respondents were higher than the ratings to the same outcome statements by AVTS respondents. This pattern was most dramatically noted in the Technical Skills factor grouping.

Delivery configurations selected by respondents were analyzed through the use of a Chi Square test. Although statistically significant differences were found between the delivery configuration patterns selected by the AVTS and CHS respondents, it was determined that these differences were of no practical significance due to the high similarity of selection patterns by both groups of respondents. The patterns identified most frequently revealed a high percentage of selections with a delivery configuration of equal vocational and academic involvement. Other delivery configuration selections were more directional and reflected a delivery mode consistent with the construct composition of the factor grouping. A full report of the Part I research is available as a separate document entitled, "An Investigation of Opinions Toward Selected Educational Outcomes Part I: Educators in eastern Pennsylvania, by C. P. Wichowski, T. J. Walker, and R. A. Adamsky, 1992.

Research: Part Two

The purpose of the second part of this research was to expand the knowledge gained from the first part and to explore the opinions of members of the Pennsylvania business and industrial community toward educational outcomes at the high school level. More specifically stated, this part of the investigation sought to assess the opinions of a second research population on what students should know and be able to do as a result of secondary schooling.

The following research questions were addressed in part two of the study:

1. What are the demographic characteristics of the respondents?

2. What are the degree of emphasis ratings given to the 66 educational outcome statements by the respondents? How do these ratings compare with the ratings by the respondents from education?
3. How will the degree of emphasis ratings given to the 66 educational outcome statements load into factors?
4. How will the factors from the business and industry respondents compare with the factors from educational respondents?

Answers to these questions were determined through the collection and analysis of data obtained by the use of a modified version of the Educational Outcome Survey Instrument.

Scope and Limitations

Part 2 of the research investigated the opinions of persons from business and industry in Pennsylvania toward educational outcomes which students must know and/or be able to do in order to graduate from high school. The sample used was randomly selected from the population of business and industry included in the database of the employment security section of the Bureau of Research and Statistics, Pennsylvania Department of Labor and Industry.

The findings of this study are based on the data collection instrument which was used in part 1 of this research, and modified for application to respondents from business and industry. It should be noted that the strength of the findings of this study rests on the construct validity of the data collection instrument and the statistical treatment applied to the data collected.

CHAPTER 2

PROCEDURE

INTRODUCTION

The procedures used to conduct part 2 of the Educational Outcomes Study are reported in this chapter. Detailed information is provided on the design of the study, the population and sample surveyed, the revision of the research instrument, the procedures used for the transformation of data for optical scanning as well as the statistical methods used to answer the research questions of this study.

Design of the Study

The following outline depicts the sequence of procedures used to conduct the study:

A. Identification of the population and sample:
    1. Delineate sample size and composition.
    2. Determine relationship between probable return rate and factor analysis sample size requirements.

B. Revise the research instrument:
    1. Develop appropriate demographic categories.
    2. Eliminate the delivery configuration scaling.

C. Collect data:

1. Secure mailing labels.

2. Conduct mailing.

D. Convert raw data to optical format:

1. Train and supervise data conversion teams.

2. Validate converted data.

E. Conduct analysis of data.

F. Interpret data, formulate conclusions, make recommendations and write final report.

Details on the specific procedures followed in the above outlined sequence are further developed in the remaining sections of this chapter.

Population and Sample

The population identified for this investigation included employers from all categories of business and industry in Pennsylvania. A sample size of 3,450 potential respondents was determined in order to meet or exceed the probable minimum return rate of 15% necessary to conduct a factor analysis on the data collected (based on a guideline using the number of instrument items, 66, multiplied by an index of 8). Further, the sample was structured to reflect the demographic characteristics of the states three regions as depicted in the 1990 US Census. The proportional distribution of the sample is shown in Table 1.

TABLE 1

SIZE AND DISTRIBUTION OF THE SAMPLE

Region of State	No. of Counties	Distribution of Population	Distribution of Sample	
East	17	49%	1,629	47%
Central	30	21%	778	23%
West	20	30%	1,043	30%
Total	67	100%	3,450	100%

The actual sample in the form of mailing labels was developed through the cooperative efforts of the Bureau of Research and Statistics, Employment Security Section, Pennsylvania Department of Labor and Industry. The sample was randomly selected and stratified to reflect the State's population from a database of all Pennsylvania employers participating in unemployment compensation insurance.

Due to undeliverable instruments returned by the U.S. Postal Service, the number of potential respondents in the sample was reduced to 3,364. With no follow-up mailing, there were 749 usable instruments returned for a response rate of 22.3%, thus meeting the criteria necessary to conduct the factor analysis. Overall, the response rate closely paralleled the regional composition of the State's population. This information is listed in Table 2.

TABLE 2

RESPONSE RATE

Region of State	Distribution of Sample	Number of Returns	Response Rate
East	47%	322	43%
Central	23%	196	26%
West	30%	231	31%
Total	100%	749	100%

Revision of the Research Instrument

The instrumentation used in parts 1 and 2 of this study was based on an adaptation of one used by Barnard and Wentling (1985) to identify learning outcomes for education for work programs in Illinois. The instrument used to collect data from business and industry was a modification of the one used to survey educators in the first part of this research effort. The modifications included the revision of the demographic section and the elimination of the delivery configuration segment. The revised demographic section provided for data collection on the position or title of the respondent, the type of business or service, the number of employees and the location by county. Consistent in both instruments were the 66 educational outcome statements and the four point Likert type scaling used for degree of emphasis ratings.

Also, the outcome statements retained the same order and numbering assignments as in the educators' survey which was based on a random selection in an attempt to eliminate any level of importance which might be implied by the relative positioning of items. Three versions of the instrument with different page ordering were used to compensate for any influence that fatigue or loss of interest might have had on a respondent. Copies of the revised instrument and transmittal letter are included in Appendix A. A copy of the instrument used for data collection with educators is included in Appendix B.

Data Transformation and Statistical Analysis

All data collected were transformed from completed survey instruments to optical scan sheets by conversion teams who were specifically trained for this activity. The team approach was chosen for this activity in order to reduce the fatigue associated by individuals doing the conversion and to increase the accuracy of the transformation. Further quality control was maintained through a validation of ten percent of all optical scan sheet transformations.

All data analysis and statistical testing were done through the use of the Release 4 version of SPSS and BMDP3S Statistical Software on an IBM 308 mainframe computer through the Computer Services Section, Temple University.

The research questions with the statistical method used to answer each question follow:

1. What were the demographic characteristics of the respondents? Descriptive statistics were used to answer this research question.
2. What were the degree of emphasis ratings given to the 66 statements by the respondents? How do these ratings differ between the respondents from business and industry and the respondents from education? Descriptive statistics and a Kruskal-Wallis test were used to answer these research questions.
3. How did the degree of emphasis ratings given to the 66 statements load into factors? How will these factors compare to factors identified through findings with educators? Factor Analysis was used to answer these research questions.

CHAPTER 3

FINDINGS

INTRODUCTION

The findings from the business and industry survey are presented as answers to the research questions. Each question has been restated to facilitate the presentation of the information.

Research Question 1: What are the demographic characteristics of the respondents? Descriptive statistics were used to answer this research question. The majority of the respondents, 60%, were either business owners or chief executive officers. A complete listing of the role of respondents is presented in Table 3.

TABLE 3

ROLE OF RESPONDENTS

Role	Frequency	%
HRD Director	83	11%
Business Owner/CEO	449	60%
Other	217	29%
Total	749	100%

The type of business represented by the respondents was measured across 14 categories. Three business areas accounted for 53.19% of the responses. These included 21.5% in retailing, 19.9% in the service area of business and repair, and 11.7% in the health service area. A complete listing of the business areas of respondents is presented in Table 4.

TABLE 4

BUSINESS AREAS OF RESPONDENTS

Business Area	Frequency	%
Agriculture	9	1.1%
Mining	1	0.1%
Construction	72	9.6%
Light Manufacturing	54	7.2%
Heavy Manufacturing	11	1.5%
Financial	63	8.4%
Transportation	32	4.3%
Wholesale	32	4.3%
Retail	161	21.5%
Health Service	88	11.7%
Educational Service	29	3.9%
Business/Repair Service	149	19.9%
Government	33	4.4%
Other	15	2.0%
Total	749	100.0%

The size of the businesses which responded was dominated by three categories consisting of fewer than 20 employees which accounted for more than three-fourths of those surveyed. Specifically, these included 43.8% in the 1 to 5 employee

category, 19.8% in the 6 to 10 employee category, and 11.5% in the 11 to 20 employee category. A complete listing of the number of employees of business responding is presented in Table 5.

TABLE 5

NUMBER OF EMPLOYEES

No. of Employees	Frequency	%
1 to 5	328	43.8%
6 to 10	148	19.8%
11 to 20	86	11.5%
21 to 50	79	10.5%
51 to 100	27	3.6%
101 to 250	36	4.8%
251 to 500	9	1.2%
501 and Over	36	4.8%
Total	749	100.0%

Research Question 2: What are the degree of emphasis ratings given to the 66 educational outcome statements by the respondents? How do these ratings differ between the respondents from business and industry and the respondents from education? This question was answered through the computation of mean degree of emphasis ratings as well as the development of a rank-order listing of educational outcome statement mean ratings. The information is presented in Table 6.

A Kruskal-Wallis test was used to measure differences between the mean degree of emphasis ratings by respondents from business and industry and those from

education. Although statistically significant differences were found between those two groups, it was determined the differences were due to large sample sizes and after further inspection it was concluded they were of no practical significance.

A comparative inspection of the mean degree of emphasis ratings and the rank-order listings from these two populations was also made. The top range of mean ratings of outcome statements was essentially the same for the ratings given by the respondents from business and industry ($\underline{M}$ = 3.90) and educators ($\underline{M}$ = 3.91); while the low end was approximately 20% lower by the business and industry group ($\underline{M}$ = 2.59) than the educators ($\underline{M}$ = 3.02). The composition of the top ten and bottom ten rank-order listing of outcome statements by these two groups of respondents were, however, approximately the same. This similarity is illustrated in Table 7.

TABLE 6

RANK ORDER LISTING OF DEGREE OF EMPHASIS

RATINGS - BUSINESS AND INDUSTRY

Rank Order	Mean	Item No.	Outcome Statement
1.	3.903	50.	An ability to be dependable on the job.
2.	3.871	38.	An ability to follow directions.
3.	3.870	35.	A positive attitude toward work.
4.	3.824	2.	An ability to be on time.

Table 6 (Cont.)

Rank Order	Mean	Item No.	Outcome Statement
5.	3.809	1.	An ability to effectively communicate verbally and in writing.
6.	3.808	59.	A positive attitude toward learning.
7.	3.807	55.	The desire to work hard.
8.	3.717	16.	A proficiency in applying reading skills.
9.	3.703	17.	An ability to work as a team member.
10.	3.696	4.	A positive attitude toward co-workers.
11.	3.695	53.	A respect for authority.
12.	3.694	47.	An ability to get along with a variety people.
13.	3.693	54.	An ability to meet an identified standard when performing a job.
14.	3.692	18.	An ability to perform a job safely.
15.	3.671	13.	An ability to efficiently manage time and materials.
16.	3.657	58.	A feeling of self-confidence.
17.	3.656	60.	An understanding of employer's expectations.
18.	3.633	48.	A respect for the equal rights and worth of all men and women in our society.

Table 6 (Cont.)

Rank Order	Mean	Item No.	Outcome Statement
19.	3.629	25.	A positive attitude toward personal and physical health.
20.	3.616	8.	An ability to work without close supervision.
21.	3.572	20.	A proficiency in arithmetic.
22.	3.559	43.	An understanding of the steps required to do a job.
23.	3.526	63.	An ability to fill out a job application.
24.	3.518	19.	An understanding of the need to upgrade job skills.
25.	3.517	31.	A proficiency in decision-making skills.
26.	3.513	26.	A positive attitude toward persons from different ethnic and racial backgrounds.
27.	3.501	5.	An awareness of the dangers of tobacco, alcohol and drugs.
28.	3.491	39.	A proficiency in applying writing skills.
29.	3.490	30.	An ability to present a good image to an employer.
30.	3.437	65.	An awareness of the need for lifelong learning.
31.	3.402	33.	An awareness of one's personal strengths and limitations.

Table 6 (Cont.)

Rank Order	Mean	Item No.	Outcome Statement
32.	3.395	3.	A proficiency in a core of basic skills designed to prepare students for advanced study.
33.	3.395	22.	An understanding of rights and duties as a worker.
34.	3.380	24.	An ability to be creative and make suggestions to improve the job.
35.	3.368	10.	An understanding of terminology related to a job.
36.	3.346	11.	An ability to interview effectively for a job.
37.	3.345	6.	Be able to select, manage and maintain personal and family resources.
38.	3.341	34.	A knowledge of how to approach an employer for potential employment.
39.	3.333	7.	An understanding of personal abilities and interests.
40.	3.317	12.	An understanding of risk taking and its consequences.
41.	3.315	66.	A knowledge of how to look for a job.
42.	3.313	45.	An understanding of technical information related to a job.
43.	3.307	49.	A proficiency in operating tools and equipment needed for a job.

Table 6 (Cont.)

Rank Order	Mean	Item No.	Outcome Statement
44.	3.304	40.	A desire to seek out job opportunities.
45.	3.301	52.	Be able to use information sources and research techniques.
46.	3.281	57.	Positive values and attitudes toward the protection of the environment.
47.	3.272	21.	A knowledge of training required for advancement in the job.
48.	3.247	37.	An understanding of family life.
49.	3.228	9.	An understanding of the principles and concepts of craftsmanship.
50.	3.195	36.	An awareness of current and projected job opportunities.
51.	3.158	23.	An awareness of the special tools and equipment needed for a job.
52.	3.133	32.	A proficiency in using a computer.
53.	3.129	44.	An ability to prepare a resume.
54.	3.098	27.	An understanding of the ecology problems facing our society.
55.	3.092	56.	An awareness of the participatory nature of the democratic process.
56.	3.051	42.	An identified career goal.

Table 6 (Cont.)

Rank Order	Mean	Item No.	Outcome Statement
57.	3.035	46.	A proficiency in consumer decision making skills.
58.5.	3.984	28.	An understanding of basic scientific concepts and processes.
58.5.	2.984	62.	Knowledge of basic economic principles.
60.	2.977	51.	Knowledge of human growth and development and good nutrition.
61.	2.961	14.	An awareness of aesthetic criteria and concepts of design as they may be applied to decision making.
62.	2.911	64.	An understanding of the environment at the local, regional and global levels.
63.	2.890	61.	A proficiency in measurement and geometry.
64.	2.782	41.	A proficiency in basic algebra.
65.	2.592	15.	An understanding of the influence that art and literature have on our society.
66.	2.581	29.	An understanding of labor unions and how they affect the worker or job.

TABLE 7

UPPER AND LOWER RANK ORDER LISTING OF DEGREE OF EMPHASIS RATINGS: BUSINESS AND INDUSTRY AND EDUCATORS

TOP 10

Business and Industry		Educators	
Item No.	Mean	Item No.	Mean
50.	3.903	38.	3.909
38.	3.871	50.	3.898
35.	3.870	2.	3.890
2.	3.824	35.	3.870
1.	3.809	18.	3.867
59.	3.808	59.	3.857
55.	3.807	53.	3.845
16.	3.717	16.	3.829
17.	3.703	55.	3.818
4.	3.696	1.	3.812

BOTTOM 10

Business and Industry		Educators	
Item No.	Mean	Item No.	Mean
46.	3.035	46.	3.385
28.	3.984	61.	3.381
62.	2.984	56.	3.372
51.	2.977	51.	3.352
14.	2.961	64.	3.292
64.	2.911	14.	3.282
61.	2.890	62.	3.236
41.	2.782	29.	3.209
15.	2.592	41.	3.181
29.	2.581	15.	3.023

Research Question 3: How will the degree of emphasis ratings given to the 66 educational outcome statements load into factors? How will these factors compare to the factors identified through findings with educators?

A principal components factor analysis with a varimax rotation was used to answer the first part of this question. The second part of this question was answered through inspection as well as through the application of a confirmatory method of factor analysis after spurious variables were eliminated. The criteria used to identify factors were the same in both cases: (1) that there be at least two items included in the factor and (2) that each item must load at a .30 level or higher.

Eleven factors were identified in the initial principal components factor analysis. Although a .30 minimum loading level criterion was used, it should be noted that 98.5% of the 66 items that were factor elements loaded above the .35 level and 92.5% of the 66 items that were factor elements loaded above the .40 level. Names used to describe each factor were based on an inspection of the component outcome statements. Also, where similarities were present, names used with factors found with the educational data in the previous study were given preference. A complete presentation of the factors identified, with loading levels, is presented in Table 8.

TABLE 8

FACTORS IDENTIFIED: BUSINESS AND INDUSTRY

Item No.	Factor Title and Outcome Statements	Loading Level
	Factor 1 - Job Search Skills	
11.	An ability to interview effectively for a job.	.738
34.	A knowledge of how to approach an employer for potential employment.	.732
66.	A knowledge of how to look for a job.	.726
44.	An ability to prepare a resume.	.716
63.	An ability to fill out a job application.	.704
40.	A desire to seek out job opportunities.	.594
36.	An awareness of current and projected job opportunities.	.547
30.	An ability to present a good image to an employer.	.534
6.	Be able to select, manage and maintain personal and family resources.	.427
29.	An understanding of labor unions and how they affect the worker or job.	.388
	Factor 2 - Occupational Survival Skills	
50.	An ability to be dependable on the job.	.723
55.	The desire to work hard.	.718

Table 8 (Cont.)

Item No.	Factor Title and Outcome Statements	Loading Level
	Factor 2 Occupational Survival Skills (Cont.)	
35.	A positive attitude toward work.	.701
54.	An ability to meet an identified standard when performing a job.	.622
38.	An ability to follow directions.	.605
60.	An understanding of employer's expectations.	.546
2.	An ability to be on time.	.536
53.	A respect for authority.	.530
4.	A positive attitude toward co-workers.	.438
	Factor 3 - Ecology	
64.	An understanding of the environment at the local, regional and global levels.	.751
27.	An understanding of the ecology problems facing our society.	.748
57.	Positive values and attitudes toward the protection of the environment.	.746
51.	Knowledge of human growth and development and good nutrition.	.561
15.	An understanding of the influence that art and literature have on our society.	.531
56.	An awareness of the participatory nature of the democratic process.	.518

Table 8 (Cont.)

Item No.	Factor Title and Outcome Statements	Loading Level
	Factor 4 - Technical Skills	
49.	A proficiency in operating tools and equipment needed for a job.	.812
45.	An understanding of technical information related to a job.	.773
23.	An awareness of the special tools and equipment needed for a job.	.759
10.	An understanding of terminology related to a job.	.638
21.	A knowledge of training required for advancement in the job.	.534
43.	An understanding of the steps required to do a job.	.507
42.	An identified career goal.	.479
	Factor 5 - Basic Skills: Math & Science	
61.	A proficiency in measurement and geometry.	.728
41.	A proficiency in basic algebra.	.712
20.	A proficiency in arithmetic.	.580
62.	Knowledge of basic economic principles.	.545
28.	An understanding of basic scientific concepts and processes.	.513
32.	A proficiency in using a computer.	.457

Table 8 (Cont.)

Item No.	Factor Title and Outcome Statements	Loading Level
	Factor 6 - Working Independently	
22.	An understanding of rights and duties as a worker.	.510
8.	An ability to work without close supervision.	.509
17.	An ability to work as a team member.	.462
9.	An understanding of the principles and concepts of craftsmanship.	.461
19.	An understanding of the need to upgrade job skills.	.460
18.	An ability to perform a job safely.	.452
14.	An awareness of aesthetic criteria and concepts of design as they may be applied to decision making.	.399
12.	An understanding of risk taking and its consequences.	.396
13.	An ability to efficiently manage time and materials.	.372
	Factor 7 - Learning and Self-Concept	
58.	A feeling of self-confidence.	.608
65.	An awareness of the need for lifelong learning.	.584
7.	An understanding of personal abilities and interests.	.514

Table 8 (Cont.)

Item No.	Factor Title and Outcome Statements	Loading Level
	Factor 8 - Basic Skills: Reading and Writing	
52.	Be able to use information sources and research techniques.	.362
59.	A positive attitude toward learning.	.313
1.	An ability to effectively communicate verbally and in writing.	.674
39.	A proficiency in applying writing skills.	.602
3.	A proficiency in a core of basic skills designed to prepare students for advanced study.	.555
16.	A proficiency in applying reading skills.	.450
	Factor 9 - Equal Rights	
48.	A respect for the equal rights and worth of all men and women in our society.	.697
26.	A positive attitude toward persons from different ethnic and racial backgrounds.	.695
47.	An ability to get along with a variety of people.	.471
	Factor 10 - Decision Making	
31.	A proficiency in decision making skills.	.620

Table 8 (Cont.)

Item No.	Factor Title and Outcome Statements	Loading Level
	Factor 11 - Health and Family	
24.	An ability to be creative and make suggestions to improve the job.	.583
33.	An awareness of one's personal strengths and limitations.	.425
46.	A proficiency in consumer decision making skills.	.366
5.	An awareness of the dangers of tobacco, alcohol and drugs.	.490
25.	A positive attitude toward personal and physical health.	.443
37.	An understanding of family life.	.414

A comparison of factors identified with the respondents from business and industry and the educators previously surveyed in Eastern Pennsylvania was also made. Through inspection, high levels of congruence (i.e. factors with common outcome statements) were found in five factor groupings. These groupings included Job Search Skills, Occupational Survival Skills, Technical Skills as well as a combination of Basic and Higher Order Skills.

The Job Search Skills Factor from business and industry included ten outcome statements. The Job Search Skills Factor from educators included eight outcome

statements. Seven outcome statements were common to both factors; these have been highlighted by underlining in Tables 9 and 10.

The Occupational Survival Skills Factor from business and industry included nine outcome statements. The Occupational Survival Skills Factor from educators included ten outcome statements. Eight outcome statements were common to both factors; these have been highlighted by underlining in Tables 12 and 13.

The Technical Skills Factor from business and industry included seven outcome statements. The Technical Skills Factor from educators included nine outcome statements. Five outcome statements were common to both factors; these have been highlighted by underlining in Tables 14 and 15.

There were two basic skill factor groupings of outcome statements identified from business and industry. The one for math and science basic skills included six outcome statements and the one for reading and writing basic skills included four outcome statements. There were also two basic skill related factor groupings of outcome statements identified by educators. The first basic skills factor included six outcome statements. The second, which was originally titled Higher Order Skills, included four outcome statements. When combined, all ten outcome statements were common to the basic skill factor groupings from both sets of respondents; these have been highlighted by underlining in Tables 17 and 18.

A congruency comparison of factors identified with respondents from Pennsylvania business and industry and educators was also made with factors identified through an educational outcomes research effort conducted in Illinois

(Barnard and Wentling, 1985). As was previously stated, the Illinois study served as a model for and was a source for 45 of the 66 outcome statements used in this study.

The Illinois researchers collected data from 1,019 respondents consisting of educators at the secondary and post-secondary level as well as persons from business and industry using a survey instrument designed to measure the degree of emphasis that should be placed on selected educational outcomes. In their factor analysis, five factors were found; three of the five factors had high levels of congruency with factor groupings from both the business and industry and the educational respondents in Pennsylvania. These factors included Job Search Skills, Technical Skills and the Basic Skills.

The Job Search Skills Factor had seven educational outcome statements common to the three sets of findings. These are highlighted with underlining in Tables 9, 10, and 11.

The Technical Skills Factor had five educational outcome statements common to the three sets of findings. These are highlighted with underlining in Tables 14, 15 and 16.

The Basic Skills Factor had five educational outcome statements common to the three sets of findings. These are highlighted with underlining in Tables 17, 18, and 19.

TABLE 9

JOB SEARCH SKILLS: BUSINESS AND INDUSTRY

Factor Loading Level	Mean*	Item No.**	Outcome Statement
.738	3.346	11.	An ability to interview effectively for a job.
.732	3.341	34.	A knowledge of how to approach an employer for potential employment.
.726	3.315	66.	A knowledge of how to look for a job.
.716	3.119	44.	An ability to prepare a resume.
.704	3.526	63.	An ability to fill out a job application.
.594	3.304	40.	A desire to seek out job opportunities.
.547	3.195	36.	An awareness of current and projected job opportunities.
.534	3.490	30.	An ability to present a good image to an employer.
.427	3.345	6.	Be able to select, manage and maintain personal and family resources.
.388	2.581	29.	An understanding of labor unions and how they affect the worker or job.

*Means were computed on degree of emphasis ratings provided by respondents on a four point Likert type scale with a low of one and a high of four.

**Item numbers are based on the outcome statement numbers used on the survey instrument; the order of these numbers and corresponding outcome statements reflect factor loading levels.

TABLE 10

JOB SEARCH SKILLS: EDUCATORS

Factor Loading Level	Mean*	Item No.**	Outcome Statement
.630	3.578	44.	An ability to prepare a resume.
.594	3.667	34.	A knowledge of how to approach an employer for potential employment.
.562	3.023	66.	A knowledge of how to look for a job.
.545	3.801	11.	An ability to interview effectively for a job.
.535	3.236	63.	An ability to fill out a job application.
.465	3.656	36.	An awareness of current and projected job opportunities.
.447	3.612	40.	A desire to seek out job opportunities.
.401	3.591	42.	An identified career goal.

*Means were computed on degree of emphasis ratings provided by respondents on a four point Likert type scale with a low of one and a high of four.

**Item numbers are based on the outcome statement numbers used on the survey instrument; the order of these numbers and corresponding outcome statements reflect factor loading levels.

TABLE 11

JOB SEARCH SKILLS: PREVIOUS RESEARCH IN ILLINOIS

Factor Loading Level	Item No.**	Outcome Statement
.670	34.	A knowledge of how to approach an employer for potential employment.
.646	11.	An ability to interview effectively for a job.
.625	66.	A knowledge of how to look for a job.
.598	44.	An ability to prepare a resume.
.587	40.	A desire to seek out job opportunities.
.559	63.	An ability to fill out a job application.
.544	30.	An ability to present a good image to an employer. +
.467	42.	An identified career goal. + +
.467	22.	An understanding of rights and duties as a worker.
.447	21.	A knowledge of training required for advancement in the job.
.440	36.	An awareness of current and projected job opportunities.

*For comparison purposes, the item numbers on this table have been correlated to the outcome statements items numbers used in Tables 9 and 10.

+ Outcome No. 30 was congruent with the factor grouping found with Pennsylvania business and industry - see Table 9.

+ + Outcome No. 42 was congruent with the factor grouping found with Pennsylvania educators - see Table 10.

NOTE: Due to differences in the Likert type scales used in the Illinois survey and the Pennsylvania survey, mean degree of emphasis ratings have not been listed in this table.

TABLE 12

OCCUPATIONAL SURVIVAL SKILLS:

BUSINESS AND INDUSTRY

Factor Loading Level	Mean*	Item No.**	Outcome Statement
.723	3.903	50.	An ability to be dependable on the job.
.718	3.807	55.	The desire to work hard.
.701	3.870	35.	A positive attitude toward work.
.622	3.693	54.	An ability to meet an identified standard when performing a job.
.605	3.871	38.	An ability to follow directions.
.546	3.656	60.	An understanding of employer's expectations.
.536	3.824	2.	An ability to be on time.
.530	3.695	53.	A respect for authority.
.438	3.696	4.	A positive attitude toward co-workers.

*Means were computed on degree of emphasis ratings provided by respondents on a four point Likert type scale with a low of one and a high of four.

**Item numbers are based on the outcome statement numbers used on the survey instrument; the order of these numbers and corresponding outcome statements reflect factor loading levels.

TABLE 13

OCCUPATIONAL SURVIVAL SKILLS: EDUCATORS

Factor Loading Level	Mean*	Item No.**	Outcome Statement
.656	3.695	53.	A respect for authority.
.653	3.903	50.	An ability to be dependable on the job.
.622	3.807	55.	The desire to work hard.
.617	3.871	38.	An ability to follow directions.
.581	3.808	59.	A positive attitude toward learning.
.562	3.870	35.	A positive attitude toward work.
.558	3.657	58.	A feeling of self-confidence.
.487	3.656	60.	An understanding of employer's expectations.
.454	3.693	54.	An ability to meet an identified standard when performing a job.
.447	3.824	2.	An ability to be on time.

*Means were computed on degree of emphasis ratings provided by respondents on a four point Likert type scale with a low of one and a high of four.

**Item numbers are based on the outcome statement numbers used on the survey instrument; the order of these numbers and corresponding outcome statements reflect factor loading levels.

TABLE 14

TECHNICAL SKILLS: BUSINESS AND INDUSTRY

Factor Loading Level	Mean*	Item No.**	Outcome Statement
.812	3.31	49.	A proficiency in operating tools and equipment needed for a job.
.773	3.31	45.	An understanding of technical information related to a job.
.759	3.16	23.	An awareness of the special tools and equipment needed for a job.
.656	3.37	10.	An understanding of terminology related to a job.
.534	3.27	21.	A knowledge of training required to do a job.
.507	3.56	43.	An understanding of the steps required to do a job.
.401	3.05	42.	An identified career goal.

*Means were computed on degree of emphasis ratings provided by respondents on a four point Likert type scale with a low of one and a high of four.

**Item numbers are based on the outcome statement numbers used on the survey instrument; the order of these numbers and corresponding outcome statements reflect loading levels.

TABLE 15

TECHNICAL SKILLS: EDUCATORS

Factor Loading Level	Mean*	Item No.**	Outcome Statement
.697	3.66	23.	An awareness of the special tools and equipment needed for a job.
.558	3.78	49.	A proficiency in operating tools and equipment needed for a job.
.656	3.71	10.	An understanding of terminology related to a job.
.619	3.63	9.	An understanding of the principles and concepts of craftsmanship.
.585	3.63	45.	An understanding of technical information related to a job.
.582	3.74	43.	An understanding of the steps required to do a job.
.563	3.86	18.	An ability to perform a job safely.
.404	3.60	22.	An understanding of rights and duties as a worker.
.364	3.74	30.	An ability to present a good image to an employer.

*Means were computed on degree of emphasis ratings provided by respondents on a four point Likert type scale with a low of one and a high of four.

**Item numbers are based on the outcome statement numbers used on the survey instrument; the order of these numbers and corresponding outcome statements reflect factor loading levels.

TABLE 16

TECHNICAL SKILLS: PREVIOUS RESEARCH IN ILLINOIS

Factor Loading Level	Item No.*	Outcome Statement
.645	10.	An understanding of terminology related to a job.
.637	23.	An awareness of the special tools and equipment needed for a job.
.598	45.	An understanding of technical information related to a job.
.581	43.	An understanding of the steps required to do a job.
.567	49.	A proficiency in operating tools and equipment needed for a job.
.408	54.	An ability to meet an identified standard when performing a job.

*For comparative purposes, the item numbers on this table have been correlated to the outcome statement items numbers used in Table 14 and 15.

NOTE: Due to differences in the Likert type scales used in the Illinois survey and the Pennsylvania survey, mean degree of emphasis ratings have not been listed in this table.

TABLE 17

COMBINED BASIC SKILLS: BUSINESS AND INDUSTRY

Factor Loading Level	Mean*	Item No.**	Outcome Statement
.728	2.890	61.	A proficiency in measurement and geometry. A
.712	2.782	41.	A proficiency in basic algebra. A
.580	3.572	20.	A proficiency in arithmetic. A
.545	2.984	62.	Knowledge of basic economic principles. A
.513	2.984	28.	An understanding of basic scientific concepts and processes. A
.457	3.133	32.	A proficiency in using a computer. A
.674	3.809	1.	An ability to effectively communicate verbally and in writing. B
.602	3.491	39.	A proficiency in applying writing skills. B
.555	3.395	3.	A proficiency in a core of basic skills designed to prepare students for advanced study. B
.450	3.717	16.	A proficiency in applying reading skills. B

*Means were computed on degree of emphasis ratings provided by respondents on a four point Likert type scale with a low of one and a high of four.

**Item numbers are based on the outcome statement numbers used on the survey instrument; the order of these numbers and corresponding outcome statements reflect loading levels.

A Indicate those outcome statements which factored into the math and science basic skills cluster.

B Indicates those outcome statements which factored into the reading and writing basic skills cluster.

TABLE 18

COMBINED BASIC SKILLS: EDUCATORS

Factor Loading Level	Mean*	Item No.**	Outcome Statement
.701	3.809	1.	An ability to effectively communicate verbally and in writing. A
.699	3.717	16.	A proficiency in applying reading skills. A
.490	3.491	39.	A proficiency in applying writing skills. A
.486	3.572	20.	A proficiency in arithmetic. A
.459	3.395	3.	A proficiency in a core of basic skills designed to prepare students for advanced study. A
.371	3.133	32.	A proficiency in using a computer. A
.699	2.890	61.	A proficiency in measurement and geometry. B
.627	2.782	41.	A proficiency in basic algebra. B
.513	2.984	62.	Knowledge of basic economic principles. B
.465	3.984	28.	An understanding of basic scientific concepts and processes. B

*Means were computed on degree of emphasis ratings provided by respondents on a four point Likert type scale with a low of one and a high of four.

**Item numbers are based on the outcome statement numbers used on the survey instrument; the order of these numbers and corresponding outcome statements reflect loading levels.

A Indicate those outcome statements which factored into the basic skills cluster.

B Indicates those outcome statements which factored into the higher order basic skills cluster.

TABLE 19

BASIC SKILLS: PREVIOUS RESEARCH IN ILLINOIS

Factor Loading Level	Item No.*	Outcome Statement
.680	39.	A proficiency in applying writing skills.
.656	16.	A proficiency in applying reading skills.
.643	1.	An ability to effectively communicate verbally in writing.
.477	20.	A proficiency in applying math skills.
.402	3.	A proficiency in a core of basic skills designed to prepare students for advanced study.

*For comparison purposes, the item numbers on this table have been correlated to the outcome statement items numbers used in Table 17 and 18.

NOTE: Due to differences in the Likert type scales used in the Illinois survey and the Pennsylvania survey, mean degree of emphasis ratings have not been listed in this table.

CHAPTER 4

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

The Temple University Center for Vocational Education Professional Personnel Development conducted a two-part survey research study to gain more knowledge about educational outcomes for high school students in Pennsylvania. Part one of the investigation surveyed educators (N = 1,089) from school districts and Area Vocational-Technical Schools in the eastern region of the State, and part two queried employers and business persons from across the Commonwealth. Both surveys sought to assess opinions on what students should know and be able to do as a result of secondary schooling. The questionnaire used in both parts of the study (The Educational Outcome Survey), was based on an adaptation of one used by Barnard and Wentling (1985) to identify learning outcomes for education for work programs in Illinois.

This monograph focused on part two of the research, the opinions on educational outcomes by personnel from business and industry. Data were collected from a statewide randomly selected sample of 3,364 members of the business and industrial community identified by the Bureau of Research and Statistics, Employment Security Section, Pennsylvania Department of Labor and Industry. A modified version of the Educational Outcome Survey instrument used with the educators in the part one investigation was used to survey the business participants. From a mailed survey, the number of usable returns was 749, which represented a return rate of 22.3%.

Data analysis included an inspection of survey demographics, a review of descriptive statistics on the ratings of the educational outcome statements, and a factor analysis of the outcome statement ratings. The demographic profile of the respondents was consistent with the proportional distribution of business and industry size in Pennsylvania, as well as by regional location. Data collected were, therefore, considered to be representative.

An inspection of mean ratings and rank-order listings of the outcome statements was also conducted, and compared to the part one findings. The top range mean ratings of outcome statements was essentially the same for the respondents from business and industry (M = 3.90) and education (M 3.91). The low end ratings, however, were approximately 20 % lower by the business and industry group (M = 2.59) than the educators (M = 3.02). The composition of the top 10 and bottom 10 rank-order listing of outcome statements by the two groups were essentially the same.

Of significance are the levels of congruence between the factor analyses of outcome statement ratings for the educators and the business persons. Through inspection there were high levels of congruence in five factor groupings: Technical Skills, Job Search Skills, Occupational Survival Skills, and in a combination of Basic and Higher Order Skills. In addition, the high level of factor congruence prevailed in a comparison made with a related piece of educational outcomes research conducted in Illinois (Barnard & Wentling, 1987). The similarity in factor composition between the Illinois and Pennsylvania studies is important because it lends empirical support to the recommendations of several educational and industrial commissions around the country regarding educational reform and school restructuring (see, for example, "America's Choice: High Skills or Low Wages", (Commission on the Skills of the American Workforce, 1990) "What Work Requires of Schools", (U.S. Dept. of Labor-SCANS, 1991) and "America 2000: An Education Strategy", (U.S. Department of Education, 1991).

CONCLUSIONS

The following conclusions are made as a result of the data collected and analyzed in this study. The companion study (i.e., Part 1) which preceded this investigation as well as selected portions of related literature were also considered.

1. Personnel from business and industry and education have similar opinions about what students should know and be able to do to graduate from high school.
2. Personnel from business and industry and education have similar opinions about the priority of outcomes that students should know and be able to do to graduate from high school.
3. The content of five factors identified in this study of business and industry personnel was congruent with the content of five factors identified by educators (i.e., in the Part 1 investigation), and similar to the content of factors identified in a study conducted in Illinois by Barnard and Wentling (1987). The factor titles were Technical Skills, Job Search Skills, Occupational Survival Skills, and a combination of Basic and Higher Order Skills.

RECOMMENDATIONS

The following recommendations are based on the analysis of data collected and on a synthesis of selected portions of literature reviewed:

1. A technical skills cluster of student educational outcomes should be included under the Career Education and Work goal of the 1992 proposed regulations of 22 PA Code, Chapter 5, Curriculum (Requirements).
2. The five factor groupings identified herein, with their 28 component student educational outcomes, should be used as a core structure in the reorganization of the content of the Career Education and Work goal of the 1992 proposed regulations of 22 PA Code, Chapter 5, Curriculum (Requirements).
3. A student learning outcome that addresses the concept of technical skill development should be included in the Career Education and Work goal of the 1992 proposed regulations of 22 PA Code, Chapter 5, Curriculum (Requirements). The outcome should state that; "All students develop technical skills which are appropriate to their career interest area and incorporate the selection, proper use of and maintenance of appropriate tools, equipment, processes and technology."
4. A set of career exploratory and technology problem solving learning activities should be developed for the primary school curriculum. The activities should be based on the educational outcome factor groupings identified in this study.
5. Guidelines for the development of curriculum and learning activities should be formulated that will: (a) contribute to the horizontal articulation of vocational

and academic areas at the secondary level, and (b) be vertically articulated with the primary level.

6. The rank order findings of the degree of emphasis ratings given to educational outcome statements in this study should be considered for identifying areas of emphasis for curriculum at the secondary and primary school levels.
7. Instructional strategies with outcomes should be developed to address: (a) an understanding level of knowledge in the area of technical skills for the post-secondary directed secondary student and (b) a demonstration/performance level of skill and knowledge in the area of technical skills for the employment directed secondary student.
8. The findings of the factor analysis portion of this study should be used as a matrix for the development of curriculum materials.

In view of the findings and conclusions of this study, the following areas are recommend for further research and development:

1. Similar studies should be conducted on the degree of emphasis that should be placed on student educational outcomes using other populations and samples to include (a) parents of secondary school juniors and seniors, and (b) recent secondary school graduates.
2. Similar student education outcomes research should be conducted using a factor analytical statistical approach in various academic disciplines and inter-discipline areas.

EPILOGUE

The findings of Part I of this research were presented as testimony to the Pennsylvania State Board of Education on December 12, 1991. The combined findings of Part I and the preliminary findings of Part II of this research were presented as testimony to the Pennsylvania State Board of Education on May 28, 1992. The complete findings of Parts I and II of this research were presented as testimony to the Pennsylvania House of Representatives Committee on Education on June 12, 1992. The May 28 and the June 12 testimony proposed the following student leaning outcome be included in the revised State School Code under the goal area of "Career Education and Work":

5.202. Student Learning Outcomes
(8) Career Education and Work
(E) All students develop technical skills which are appropriate to their career interest area and incorporate the selection, proper use of and maintenance of appropriate tools, equipment, processes and technology.

The revised State School Code as adopted on July 24, 1993 included a modified version of the proposed technical skills student learning outcome. Prior student learning outcomes under the Career Education and Work sub-section proposed by the State School Board did not include any reference to the development of technical skills by students in the secondary schools of Pennsylvania.

A complete text of the testimony presented to the State School Board and the House Committee on Education is included in the remainder of this epilogue.

Testimony to The Pennsylvania State Board of Education on the Proposed Revisions of the Regulations for Chapter 5 (Curriculum Requirements)

by

Richard A. Adamsky, Professor
Chester P. Wichowski, Senior Research Associate
Thomas J. Walker, Associate Professor

Temple University
Center for Vocational Education
Professional Personnel Development

December 12, 1991
Philadelphia, Pennsylvania

Note: The content and opinions expressed in this paper reflect the views of the authors only. They do not reflect the policy or position of any agency or institution and no official endorsement should be inferred.

Testimony Presented to the Pennsylvania State Board of Education

by
The Temple University Center for Vocational Education Professional Personnel Development

It is our privilege (The Temple University Center for Vocational Education Professional Personnel Development) to present testimony to the State Board of Education on the proposed changes for Chapters 3, 5, and 6 of the State's Regulations. Our testimony will be directed to Chapter 5. Specifically, we will focus on the student learning outcomes that have been drafted to describe the goal entitled, Career Education and Work. Before we begin we would like to make it clear that we fully support the notion of having student learning outcomes used as the basis for judging the adequacy of education in the Commonwealth. Our sense is that a "curriculum framework" that describes what students must achieve and be able to do as a result of schooling can provide school districts with a clear vision for structuring programs and services for developing the abilities of all Pennsylvania's youth.

Improving schools and schooling in America was the clarion call of legislators, CEOs, and education policy makers alike during the reform oriented 1980s. Interestingly, the calls have not subsided. In fact, several recent national and state reports including America's Choice: High Skills or Low Wages (National Center for Education and the Economy, 1990), Workplace Basics: The Skills Employers Want (American Society for Training and Development & U.S. Department of Labor, 1988), What Work Requires of Schools, (U.S. Department of Labor's Commission on

Achieving Necessary Skills, 1991), and A State Prepared: Developing Pennsylvania's Work Force (Pennsylvania Economic Development Partnership, 1991) have made it abundantly clear that business and government have not just taken a passing interest in education's role in preparing young people for careers and for work. Clearly, developing quality schools and a quality work force capable of competing for jobs in today's international economy, will continue to be a national priority.

We at the Temple Center are troubled by reports that a large number of youth leave school each year lacking the basic knowledge required to find and hold a good job. Because of our interest in young people, and because of our tradition of involvement in outcomes based education, we were prompted to begin a study to identify learning outcomes for secondary level students in Pennsylvania. We wanted to be able to shed some light on what students who graduate from the Commonwealth's high schools should be able to do in order to make a successful transition to work or additional education. Our presentation today will focus on this study.

The intent of our research is to determine learning outcomes for secondary level students. Specifically, we want to be able to describe what students should know and be able to do as a result of secondary schooling. Our study is designed to collect data in stages: In stage one we will collect data from secondary school personnel; in stage two, from personnel in small and large businesses; and in stage three, from the parents of secondary school students.

We have completed stage one. As of this moment, data have been collected from 1,089 secondary school academic and vocational educators in the eastern region of Pennsylvania. A little over 75% of the educators (n = 822) were employed at Area Vocational Technical Schools (AVTSs). The remainder (n = 264), were employed in the comprehensive high school setting (3 cases were unidentified). Included in the group were 982 teachers (633 vocational, 341 academic, 8 unclassified), 37 administrators, 46 counselors, 19 persons classified as "other," and 2 who were unclassified. The subjects represented 15 counties in eastern Pennsylvania, and they worked in 45 schools.

The instrument used in our study is an adaptation of one used by Barnard and Wentling (1985) to identify learning outcomes for education for work programs in Illinois. In the Illinois study, outcomes were defined as a value added concept, specifically, as broad expressions of what students must know and be able to do as a result of schooling. We used the same operational definition for "learning outcome" in our study. Barnard and Wentling used factor analysis techniques to determine what underlying constructs were being measured by the 45 outcome statements (items) on their questionnaire. They identified 5 factors (i.e., categories of outcomes) on which 30 items loaded at the .4 or higher level. No fewer than two outcomes at that loading level were needed to establish a factor.

We included all 45 outcome statements from the Barnard and Wentling study on the instrument for our study, but modified the response mode to suit our specific purpose. We felt that Barnard and Wentling's outcome statements related particularly

well to one of Pennsylvania's Quality Goals of Education (i.e., Career Education and Work), and that several of them addressed other goals as well. We also included an additional 21 outcome statements that were determined to be good descriptors of Pennsylvania's other Quality Goals. By doing so, we reasoned, we would have several outcomes for each of Pennsylvania's Quality Goals. We corroborated this reasoning by conducting a Q-Sort activity in which five senior faculty members at the Center, independently, were able to align each item with a goal. In all, our instrument contained 66 outcomes that we believed tied to the 12 Quality Goals of Education in Pennsylvania.

We asked the educators we surveyed to make two ratings on our instrument. First, to indicate the degree to which each outcome should be emphasized in secondary education, and second, which education sector would be most appropriate for developing students' ability to meet the intent of the outcomes (the academic setting, the vocational setting, or some combination of both).

The academic and vocational educators agreed (mean = 3.7 on a scale where 1 represented no emphasis. and 4 represented a great emphasis) that all 66 items should be emphasized in secondary education. Differences between the educators were found, however, in the degree of emphasis given to specific learning outcomes, and in the educational sector that should be responsible to meet the intent of the outcomes. The respondents considered most learning outcomes that were clearly related to career development or work to be primarily the province of vocational education, and those clearly related to academic learnings primarily the province of

academic education. Interestingly, the respondents considered most of the outcomes to be the shared province of both vocational and academic education. We take this to mean that there is widespread agreement among basic educators in eastern Pennsylvania supporting the notion of curriculum coherence between vocational and academic education.

We also factor analyzed the outcome statements in order to extend the work of Barnard and Wentling (1985). The analysis focused on the academic and vocational educators responses to the emphasis that should be placed on the student learning outcomes. It resulted in our 66 items being grouped into 9 factors. Five of the factors, however, contained approximately the same outcome statements as the 5 factors identified by Barnard and Wentling. While it is significant that all items loaded into factors, it is the second finding that we believe to be particularly important.

In the Barnard and Wentling study, 30 of their 45 outcomes loaded in 5 factors when their respondents were queried as to whether the outcomes should be emphasized in education for work programs in Illinois. In our study, all 45 of their outcomes loaded in one or another of the 9 factors we found. What surprised us, however, was that of the 30 outcomes that loaded for Barnard and Wentling, 28 of them also loaded for us and in the same 5 factors. In other words, 28 of 30 learning outcome statements loaded into the same 5 factors in both studies. Apparently, the perceptions of the 1019 subjects that Bernard and Wentling studied (which included persons from business and industry, and vocational professional personnel from the state department of education, state advisory council, career guidance centers,

universities, area vocational schools, and comprehensive high schools), differed little from the 1089 secondary school educators that we studied. The reason the finding is surprising, though, is because our study included 366 academic educators from both the AVTS and comprehensive high school settings. The educators that Bernard and Wentling surveyed were all vocational education personnel.

We do want to point out that the sequence in which the 5 factors emerged from analysis differed in both studies. In the Bernard and Wentling study the factors emerged in the following sequence:

Factor I--Job Search Skills,

Factor 2--Technical Skills,

Factor 3--Affective Job Skills,

Factor 4--Basic Skills,

Factor 5--Occupational Survival Skills.

Again, remember, that we added 21 items to Barnard and Wentling's 45, for a total of 66 items. In so doing, we increased the chances that more of the student outcomes from the Barnard and Wentling study would load in a new factor. And, as was stated above, all of the items loaded in one or another of 9 factors. The factors in our study emerged in the following sequence:

Factor I--General Academic Skills,

Factor 2--Technical Skills,

Factor 3--Occupational Survival Skills,

Factor 4--Job Search Skills,

Factor 5--Affective Job Skills,

Factor 6--Basic Skills,

Factor 7--Higher Order Skills,

Factor 8--Entrepreneurial Skills,

Factor 9--Not Named.

The sequence in which the factors emerged from the analyses in the two studies is important. "General Academic Skills," for example, was factor 1 in our study. It contained 14 outcomes identified by the Temple Center and 2 outcome statements from the Bernard and Wentling study. The next 5 factors (2 - 6) were those that were nearly identical to those found by Bernard and Wentling, but, as was pointed out above, were sequenced differently. From a statistical viewpoint, the most likely reason for the difference is because of the addition of the 21 outcome statements to Barnard and Wentling's 45. The differences might also be explained by the number of years between the two studies and changes in perceptions about schooling during that time. Or, perhaps, the sequence of factors was affected because of the differences in the backgrounds of the persons surveyed. Of importance, nonetheless, is that over 2000 respondents in two different studies, agreed that the same broad constructs (factors) defined career education and work and should be emphasized in secondary education.

Recommendations

Given our findings, and the fact that they mirror those of Barnard and Wentling, we believe that the State Board should consider them carefully before endorsing the

draft list of outcome statements presently being used to describe the Career Education and Work Goal in the state's revised Chapter 5 regulations. We recommend, at least as a starting position, that the 28 learning outcomes that the two studies shared be considered as core student outcomes for a Career Education and Work goal. We recommend further that these outcomes should be grouped by the 5 titles used to describe the constructs in both studies (see Figure 1 below).

FIGURE 1. QUALITY GOAL: CAREER EDUCATION AND WORK (CORE GOALS)

Technical Skills:

- An awareness of the special tools and equipment needed for a job
- A proficiency in operating tools and equipment needed for a job
- An understanding of terminology related to a job
- An understanding of technical information related to a job
- An understanding of the steps required to do the job
- An ability to perform a job safely
- An understanding of the rights and duties as a worker
- An ability to present a good image to an employer

Occupational Survival Skills:

- An ability to be dependable on the job
- An ability to follow directions
- A positive attitude toward learning
- An ability to meet an identified standard when performing a job

Job Search Skills:

- An ability to prepare a resume
- A knowledge of how to approach an employer for potential employment
- A knowledge of how to look for a job
- An ability to interview effectively for a job
- An ability to fill out a job application
- An awareness of current and projected job opportunities
- A desire to seek out job opportunities
- An identified career goal

Affective Job Skills:

- A positive attitude toward co-workers
- A knowledge of training required for advancement in the job
- An ability to get along with a variety of people

Basic Skills:

- An ability to effectively communicate verbally and in writing
- A proficiency in applying reading skills
- A proficiency in applying writing skills
- A proficiency in arithmetic
- A proficiency in a core of basic skills designed to prepare students for advanced study

Several of the outcomes that we are proposing are already included in the revised Chapter 5. The "Basic Skills" grouping, for example, has components in the

"Communications" and "Mathematics" goals, while components of the "Occupational Survival Skills," "Job Search Skills," and "Affective Job Skills" are, for the most part, present in the "Career Education and Work" goal. Accommodating these outcomes, therefore, should not be difficult. The notable exception, however, are the **Technical Skills** outcomes. We recognize the problem that appears to be created with the addition of this category of outcomes to the proposed Chapter 5 framework. After all, the outcomes described in Chapter 5, some educational policy makers might argue, are supposed to be achievable by all students in the Commonwealth. How, then, will a college prep student intending to pursue a career in medicine demonstrate a "proficiency in operating tools and equipment needed for a job?" The point may be well taken for some students. But, if this category of outcomes is not included, how, then, can we expect those students who want to enter the work force directly after high school to perform to the levels of expectations advanced in the reports mentioned at the beginning of this testimony (e.g., What Work Requires of Schools; A State Prepared: Developing Pennsylvania's Work Force; etc.).

We believe the problem can be resolved. One way, and we are confident there are others, would be to designate levels of attainment for outcomes. The present draft of Chapter 5 sets a precedent for this approach. Some of the draft outcomes are written in such a way that students are expected to demonstrate that they can do (e.g., "All students develop a postsecondary career plan based upon previous educational achievement, specific career knowledge and career goals" p. 35). Other outcomes are written so that students are to demonstrate that they understand how to do (e.g., "Explain the impact of economic and occupational change in their own

family" p.37). We feel the same approach could be used with technical skill outcomes. Here is how it can work.

Consider, for example, two students both interested in science and technology. The first student (a college-prep student) knows that he will be enrolling in a 4 year college program to pursue a career in chemistry after graduation from high school. The second student (a tech-prep student) knows that he will have to enter the work force after graduation, hopefully, as a chemical technician to earn tuition money so he can continue his education. The first student's entry into the work force will come at some future time, after completing more formal education that will have exposed him to the specific tools, subject matter, and technology of his profession. His high school program, therefore, would have been sufficient if he graduated with "an awareness and understanding of the special tools and equipment needed for a job." The second student, however, in order to find and hold a job as a chemical technician, must graduate being "proficient in operating tools and equipment needed for a job." Anything less would place the student in a position of not being able to compete for employment in his field of choice. In this example, the student learning outcome, "special tools and equipment needed for a job," is met at two different levels: for the first student, at an awareness/understanding level; for the second student, at an application level. It can be argued, therefore, that the spirit of this "career education and work outcome" was met for both students. Postscript:

Soon we will have collected and analyzed data from small and big businesses, as well as from the parents of secondary school students (phases 2 & 3 of our study). It is our belief that these additional data are needed if we are to have student learning

outcomes that validly reflect the needs of those students affected by Career Education and Work and the other Quality Goals of Education in the Commonwealth.

The results of our factor analysis are included in Figure 2. It should be noted that the names used to describe the 9 factors are our own designations/titles, based on what the outcomes seem to focus on. Student learning outcomes that are preceded by a "number" were those that were included from the Barnard and Wentling study. Outcomes preceded by a "T" were those that were identified specifically for this study.

FIGURE 2. FACTORS FOUND FOR ALL PERSONS SURVEYED

Factor 1 - General Academic Skills

T. An understanding of the ecology problems facing our society

T. An understanding of the environment at the local, regional, and global level

T. Positive values and attitudes toward the protection of the environment

T. Knowledge of human growth and development and good nutrition

T. A respect for the equal rights and worth of all men and women in society

T. An understanding of family life

T. An awareness of the participatory nature of the democratic process

T. A positive attitude toward persons from different ethnic and racial backgrounds

T. An awareness of the dangers of tobacco, alcohol, and drugs

T. A positive attitude toward personal and physical health

T. A proficiency in consumer decision making skills

T. An understanding of the influence that art and literature have on society

T. Be able to select, manage and maintain personal and family resources

T. An understanding of personal abilities and interests 9. An understanding of labor unions and how they affect the worker and job

T. An awareness of the need for lifelong learning

Factor 2 - Technical Skills

20. An awareness of the special tools and equipment needed for a job

42. A proficiency in operating tools and equipment needed for a job

38. An understanding of terminology related to a job T. An understanding of the principles and concepts of craftsmanship

Factor 2 - Technical Skills (Cont.)

24. An understanding of technical information related to a job

35. An understanding of the steps required to do the job

16. An ability to perform a job safely

45. An understanding of the rights and duties as a worker

38. An ability to present a good image to an employer

Factor 3 - Occupational Survival Skills

41. A respect for authority

43. An ability to be dependable on the job

29. The desire to work hard

36. An ability to follow directions

19. A positive attitude toward learning

13. A positive attitude toward work

37. A feeling of self confidence

2. An understanding of employer's expectations

18. An ability to meet an identified standard when performing a job

6. An ability to be on time

Factor 4 - Job Search Skills

23. An ability to prepare a resume

39. A knowledge of how to approach an employer for potential employment

8. A knowledge of how to look for a job

31. An ability to interview effectively for a job

11. An ability to fill out a job application

10. An awareness of current and projected job opportunities

Factor 4 - Job Search Skills (Cont.)

40. A desire to seek out job opportunities

25. An identified career goal

Factor 5 - Affective Job Skills

33. An ability to work as a team member

7. A positive attitude toward co-workers

17. An understanding of the need to upgrade job skills

22. An ability to be creative and make suggestions to improve the job.

44. A knowledge of training required for advancement in the job

3. An ability to get along with a variety of people

26. A proficiency in decision-making skills

Factor 6 - Basic Skills

21. An ability to effectively communicate verbally and in writing

15. A proficiency in applying reading skills

27. A proficiency in applying writing skills

T. A proficiency in arithmetic

14. A proficiency in a core of basic skills designed to prepare students for advanced study

12. A proficiency in using a computer

Factor 7- Higher Order Skills

T. A proficiency in measurement and geometry

T. A proficiency in algebra

T. Knowledge of basic economic principles

T. An understanding of basic scientific concepts and processes

Factor 8- Entrepreneurial Skill

32. An understanding of risk taking and its consequences

T. An awareness of aesthetic criteria and concepts of design as they may be applied to decision-making

30. An ability to work without close supervision

34. An ability to efficiently manage time and materials

Factor 9- Not Named

T. Be able to use information sources and research techniques

5. An awareness of one's personal strengths and limitations

Testimony to The Pennsylvania State Board of Education on the Proposed Student Learning Outcomes (22 PA Code, Chapter 5, Section 5.202)

by

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Thomas J. Walker, Associate Professor

Temple University
Center for Vocational Education
Professional Personnel Development

May 28, 1992
Philadelphia, Pennsylvania

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Testimony Presented to the Pennsylvania State Board of Education

by

The Temple University Center for Vocational Education Professional Personnel Development

It is once again a privilege for the Temple University, Center for Vocational Education Professional Personnel Development to have an opportunity to present testimony to the State Board of Education on the proposed student learning outcomes. Specifically, we will focus our comments on the student learning outcomes under the goal heading of career education and work. The comments we will provide today will also serve as an extension to and a reinforcement of the testimony we presented to the Board on December 12, 1991; a copy of this earlier presentation has been included as an addendum to this document for the reference of the Board.

We have strong reason to contend that an educational outcome statement which addresses the concept of technical skill development should be included among the student learning outcomes currently being proposed by the Board. Further, this contention is based on a substantial body of knowledge developed as a result of a sustained research effort conducted by our Center over the last year.

During this time, the Center has conducted a two-stage study designed to determine the degree of emphasis that various populations place on selected educational outcome statements at the secondary school level in Pennsylvania. We also examined the relationship among the educational outcomes through a factor analysis of emphasis ratings. In stage one, data were collected from vocational and

academic educators in the Eastern Region of Pennsylvania (N = 1,088). In stage two, data were collected from business and industry throughout Pennsylvania (N = 749). The combined number of respondents from these two stages was 1,837.

In stage one, the vocational and academic educators felt that all 66 outcomes that they responded to should be emphasized in secondary education. The responses, when factor analyzed, grouped themselves into nine factors with the second factor being named Technical Skills. This factor contained nine outcome statements that all loaded above the .36 level, and five of which loaded above the .56 level. As is seen in Table 1, the educators clearly indicated that technical skills should be emphasized in secondary education.

In stage two of the study, persons from business and industry consisting of owners, chief executive officers and human resource directors, also felt that all 66 outcomes should be emphasized in secondary education. Through factor analysis, eleven factors were identified with Technical Skills being the forth factor identified. In the stage two analysis, the Technical Skills factor contained seven outcome statements. Five of the statements were identical to five found in stage one of the study. The five common outcome statements have been highlighted by bold face type in Table 1 and Table 2.

We confirmed our findings by comparing them with findings in an earlier research effort on educational outcome conducted by two researchers from the state of Illinois (Barnard and Wentling, 1985). It should be noted that the Illinois research study served as a model for our research in Pennsylvania.

The Illinois researchers, Barnard and Wentling, collected data from 1,019 respondents consisting of educators at the secondary and post-secondary level as well as persons from business and industry using a survey instrument designed to measure the degree of emphasis that should be placed on selected educational outcomes. In their factor analysis, five factors were found, with Technical Skills being the second factor identified. This factor was defined by six outcome statements, five of which were identical to outcome statements found in the Technical Skills factors identified in stage one and stage two of our study. The Technical Skills factor identified by Barnard and Wentling is presented in Table 3. The five outcome statements common to the three populations (Illinois, Pennsylvania stage 1, Pennsylvania stage 2) have been highlighted by boldface type.

TABLE 1

TECHNICAL SKILLS
STAGE ONE-EDUCATORS

Factor Loading Level	Mean*	Item No.**	Outcome Statement
.697	3.66	23.	**An awareness of the special tools and equipment needed for a job.**
.558	3.78	49.	**A proficiency in operating tools and equipment needed for a job.**
.656	3.71	10.	**An understanding of terminology related to a job.**
.619	3.63	9.	An understanding of the principles and concepts of craftsmanship.
.585	3.63	45.	**An understanding of technical information related to a job.**
.582	3.74	43.	**An understanding of the steps required to do a job.**
.563	3.86	18.	An ability to perform a job safely.
.404	3.60	22.	An understanding or rights and duties as a worker.
.364	3.74	30.	An ability to present a good image to an employer.

*Means were computed on degree of emphasis ratings provided by respondents on a four point Likert type scale with a low of one and a high of four.

**Item numbers are based on the outcome statement numbers used on the survey instrument.

TABLE 2

TECHNICAL SKILLS
STAGE TWO-BUSINESS AND INDUSTRY

Factor Loading Level	Mean*	Item No.**	Outcome Statement
.812	3.31	49.	**A proficiency in operating tools and equipment needed for a job.**
.773	3.31	45.	**An understanding of technical information related to a job.**
.759	3.16	23.	**An awareness of the special tools and equipment needed for a job.**
.656	3.37	10.	**An understanding of terminology related to a job.**
.534	3.27	21.	A knowledge of training required to do a job.
.507	3.56	43.	**An understanding of the steps required to do a job.**
.401	3.05	42.	An identified career goal.

*Means were computed on degree of emphasis ratings provided by respondents on a four point Likert type scale with a low of one and a high of four.

**Item numbers are based on the outcome statement numbers used on the survey instrument.

TABLE 3

TECHNICAL SKILLS
PREVIOUS RESEARCH IN ILLINOIS

Factor Loading Level	Item No.**	Outcome Statement
.645	10.	**An understanding of terminology related to a job.**
.637	23.	**An awareness of the special tools and equipment needed for a job.**
.598	10.	**An understanding of technical information related to a job.**
.581	43.	**An understanding of the steps required to do a job.**
.567	49.	**A proficiency in operating tools and equipment needed for a job.**
.408	54.	An ability to meet an identified standard when performing a job.

*For comparative purposes, the item numbers on this table have been correlated to the outcome statement items numbers used in Table 1 and 2 of this testimony.

NOTE: Due to differences in the Likert type scales used in the Illinois survey and the Pennsylvania survey, mean degree of emphasis ratings have not been listed in this table.

Based on the data collected and factor analyzed in these studies, which has involved approximately three thousand respondents from both business and industry and education, we have confirmed that five educational outcomes constitute an area representative of technical skills vital to secondary education. Further, we believe this area to be conspicuous in its absence among the educational outcomes presently proposed by the Board under the goal area of Career Education and Work. Due to this apparent oversight, we at the Center are proposing that the following student learning outcome be included in the new state school code as follows:

5.202. Student Learning Outcomes
(8) Career Education and Work
(E) All students develop technical skills which are appropriate to their career interest area and incorporate the selection, proper use of and maintenance of appropriate tools, equipment, processes and technology.

In closing, we strongly urge the Board to take action based on the findings of our research. We ask the Board to support the notion of a technical skills educational outcome in order to compliment those outcomes already proposed under the Career Education and Work Goal. By doing so, we feel that the entire set of educational outcomes proposed by the Board will be enhanced and more completely serve youth in the Commonwealth. Failure to adapt the technical skills outcome may result in the development of a Code which does not reflect the views of educators or persons from business and industry as measured in our research. Further, it may not provide for the development of a skills foundation, in the form of measurable competencies, that will allow students to develop an identity with the concepts of career education or be able to project the application of technical skills developed in school to the world of work.

ENDNOTES

1. It should be noted that the wording used in the Center proposed outcome is consistent with the five common outcomes identified in the technical skill areas found in the research reported on in this testimony. It should also be noted that the wording used in the development of this outcome is consistent with one of the five competencies identified for entry into the workplace proposed in "What Work Requires of Schools- A SCANS Report for America 2000", the Secretary's Commission on Achieving Necessary Skills, US Department of Labor (1991) which states:

   Technology - Selecting equipment and tools, applying technology to specific tasks and maintaining and troubleshooting technologies.

2. Copies of two separate abstracts which describe other aspects of the educational outcomes survey research conducted by the Center have also been included as addendum items to this testimony for the Boards reference.

Testimony to The Pennsylvania House Education Committee Pertaining to the State Board of Education's Proposed Student Learning Outcomes (22 PA Code, Chapter 5, Section 5.202)

by

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June 12, 1992
King of Prussia, Pennsylvania

Note: The content and opinions expressed in this paper reflect the views of the authors only. They do not reflect the policy or position of any agency or institution and no official endorsement should be inferred.

Testimony Presented to the Pennsylvania House Education Committee

by

Temple University College of Education
The Center for Vocational Education
Professional Personnel Development

It is a privilege for the Temple University, Center for Vocational Education Professional Personnel Development to present testimony to the Pennsylvania House Education Committee pertaining to the State Board of Education's proposed student learning outcomes. Our comments will focus on the student learning outcomes under the State goal heading for Career Education and Work. Before we begin we would like to make it clear that we fully support the notion of having student learning outcomes used as the basis for judging the adequacy of education in the Commonwealth. Our sense is that a "curriculum framework" that describes what students must achieve and be able to do as a result of schooling can provide school districts with a clear vision for structuring programs and services for developing the abilities of all Pennsylvania's youth.

Improving schools and schooling in America was the clarion call of legislators, CEOs, and education policy makers alike during the reform oriented 1980s. Interestingly, the calls have not subsided. In fact, several recent national and state reports including America's Choice: High Skills or Low Wages (National Center for Education and the Economy, 1990), Workplace Basics: The Skills Employers Want (American Society for Training and Development & U.S. Department of Labor, 1988),

What Work Requires of Schools, (U.S. Department of Labor's Commission on Achieving Necessary Skills, 1991), and A State Prepared: Developing Pennsylvania's Work Force (Pennsylvania Economic Development Partnership, 1991) have made it abundantly clear that business and government have not just taken a passing interest in education's role in preparing young people for careers and for work. Clearly, developing quality schools and a quality work force capable of competing for jobs in today's international economy, will continue to be a national priority.

We at the Temple Center are troubled by reports that a large number of youth leave school each year lacking the basic knowledge required to find and hold a good job. Because of our interest in young people, and because of our tradition of involvement in outcome-based education, we were prompted to begin a study to identify learning outcomes for secondary level students in Pennsylvania. We wanted to be able to shed some light on what students who graduate from the Commonwealth's high schools should be able to do in order to make a successful transition to work or additional education. Our presentation today will draw from this study.

The intent of our research is to explore learning outcomes for secondary level students. Specifically, we want to be able to describe what students should know and be able to do as a result of secondary schooling. Data collection is being done in three stages: In stage one data were collected from secondary school personnel; in stage two, from personnel in small and large businesses; and in stage three, from the parents of secondary school students.

At this time we have completed the first two stages. In stage one, data were collected from 1,088 vocational and academic educators in the Eastern Region of Pennsylvania and in stage two, data were collected from 749 individuals who owned or operated small and large businesses throughout Pennsylvania. The combined number of respondents from the two stages was 1,837.

The instrument used in our study was an adaptation of one used by Barnard and Wentling (1985) to identify learning outcomes for education for work programs in Illinois. In the Illinois study, outcomes were defined as a value added concept, specifically, as broad expressions of what students must know and be able to do as a result of schooling. We used the same operational definition for "learning outcome" in our study.

Barnard and Wentling used factor analysis techniques to determine the underlying constructs being measured by the 45 outcome statements (items) on their questionnaire. They identified 5 factors (i.e., categories of outcomes) on which 30 items loaded at levels high enough to be determined significant (.4 or higher). No fewer than two outcomes at that loading level were needed to establish a factor.

We included all 45 outcome statements from the Barnard and Wentling study on the instrument for our study, but modified the response mode to suit our specific purpose. We felt that Barnard and Wentling's outcome statements related particularly well to one of Pennsylvania's Quality Goals of Education (i.e., Career Education and Work), and that several of them addressed other goals as well. We also included an additional 21 outcome statements that were determined to be good descriptors of Pennsylvania's other Quality Goals. By doing so, we reasoned, we would have several

outcomes for each of Pennsylvania's Quality Goals. We corroborated this reasoning by conducting a Q-Sort activity in which five senior faculty members at the Center, independently, were able to align each item with a goal. In all, our instrument contained 66 outcomes that we believed tied to the 12 Quality Goals of Education in Pennsylvania.

We asked the educators and business persons the same question. We asked them to indicate on a scale from 1 to 4, where 1 represented no emphasis and 4 represented a great emphasis the degree to which each outcome should be emphasized in secondary education.

The average ratings computed for the respondents for each outcome were quite high (3.6 on a 4 point scale) illustrating that all 66 educational outcomes measured should be emphasized in secondary programs. Interestingly, the high degree of emphasis ratings prevailed among various sub-groups of educators and business persons that we studied (e.g. academic teachers, vocational teachers, small business, large business).

We also performed a factor analysis technique which used the degree of emphasis ratings in an objective manner to determine what, if any, interrelations might exist among the outcomes studied. The results of the factor analysis were equally as enlightening. Especially high levels of congruence (i.e. factors with common outcome statements) were found in five factor groupings. These groupings are Technical Skills, Job Search Skills, Occupational Survival Skills and a combination of Basic and Higher Order Skills. Four of the five groupings are represented among the State Board's

proposed learning outcomes. The area of Technical Skills, however, is conspicuously absent. It is on this area that the remainder of our testimony will focus.

In stage one of our research, the vocational and academic educators felt that all 66 outcomes that they responded to should be emphasized in secondary education. Their responses, when factor analyzed, grouped themselves into nine factors with the second factor being named Technical Skills. This factor contained nine outcome statements that all loaded above the .36 level, and five of which loaded above the .56 level. As is seen in Table 1, the educators clearly believe that technical skills should be emphasized in secondary education.

In stage two of the study, persons from business and industry consisting of owners, chief executive officers and human resource directors, also indicated that all 66 outcomes should be emphasized in secondary education. Through factor analysis, eleven factors were identified with Technical Skills being the forth factor identified. In the stage two analysis, the Technical Skills factor contained seven outcome statements. Five of the statements were identical to five found in stage one of the study. The five common outcome statements have been underlined in Table 1 and Table 2.

We confirmed our findings by comparing them with the findings of the Illinois researchers (Barnard and Wentling, 1985) that were mentioned earlier in the paper. The Illinois researchers, collected data from 1,019 respondents consisting of educators at the secondary and post-secondary level, as well as persons from business and industry using a survey instrument designed to measure the degree of emphasis that

should be placed on selected educational outcomes. In their factor analysis, five factors were found, with Technical Skills being the second factor identified. This factor was defined by six outcome statements, five of which were identical to outcome statements found in the Technical Skills factors identified in stage one and stage two of our study. The Technical Skills factor identified by Barnard and Wentling is presented in Table 3. The five outcome statements common to the three populations (Illinois, Pennsylvania stage 1, Pennsylvania stage 2) have been highlighted by underlining.

TABLE 1

TECHNICAL SKILLS
STAGE ONE-EDUCATORS

Factor Loading Level	Mean*	Item No.**	Outcome Statement
.697	3.66	23.	**An awareness of the special tools and equipment needed for a job.**
.558	3.78	49.	**A proficiency in operating tools and equipment needed for a job.**
.656	3.71	10.	**An understanding of terminology related to a job.**
.619	3.63	9.	An understanding of the principles and concepts of craftsmanship.
.585	3.63	45.	**An understanding of technical information related to a job.**
.582	3.74	43.	**An understanding of the steps required to do a job.**
.563	3.86	18.	An ability to perform a job safely.
.404	3.60	22.	An understanding or rights and duties as a worker.
.364	3.74	30.	An ability to present a good image to an employer.

*Means were computed on degree of emphasis ratings provided by respondents on a four point Likert type scale with a low of one and a high of four.

**Item numbers are based on the outcome statement numbers used on the survey instrument.

TABLE 2

TECHNICAL SKILLS
STAGE TWO-BUSINESS AND INDUSTRY

Factor Loading Level	Mean*	Item No.**	Outcome Statement
.812	3.31	49.	**A proficiency in operating tools and equipment needed for a job.**
.773	3.31	45.	**An understanding of technical information related to a job.**
.759	3.16	23.	**An awareness of the special tools and equipment needed for a job.**
.656	3.37	10.	**An understanding of terminology related to a job.**
.534	3.27	21.	A knowledge of training required to do a job.
.507	3.56	43.	**An understanding of the steps required to do a job.**
.401	3.05	42.	An identified career goal.

*Means were computed on degree of emphasis ratings provided by respondents on a four point Likert type scale with a low of one and a high of four.

**Item numbers are based on the outcome statement numbers used on the survey instrument.

TABLE 3

TECHNICAL SKILLS
PREVIOUS RESEARCH IN ILLINOIS

Factor Loading Level	Item No.**	Outcome Statement
.645	10.	An understanding of terminology related to a job.
.637	23.	An awareness of the special tools and equipment needed for a job.
.598	10.	An understanding of technical information related to a job.
.581	43.	An understanding of the steps required to do a job.
.567	49.	A proficiency in operating tools and equipment needed for a job.
.408	54.	An ability to meet an identified standard when performing a job.

*For comparative purposes, the item numbers on this table have been correlated to the outcome statement items numbers used in Table 1 and 2 of this testimony.

NOTE: Due to differences in the Likert type scales used in the Illinois survey and the Pennsylvania survey, mean degree of emphasis ratings have not been listed in this table.

Based on the data collected and factor analyzed in our and Barnard and Wentling's study (which involved approximately three thousand respondents from both business and industry and education), five learning outcomes have been confirmed to constitute a technical skills factor grouping vital to secondary education. We are arguing, therefore, that a "technical skills" area must be added to the State Board's proposed learning outcomes. Not to do so would set aside the opinion of educators and employers in the Commonwealth. In fact, we at the Center have proposed to the State School Board that the following student learning outcome be included in the new state school code under the goal area of "Career Education and Work":

5.202. Student Learning Outcomes
(8) Career Education and Work
(E) All students develop technical skills which are appropriate to their career interest area and incorporate the selection, proper use of and maintenance of appropriate tools, equipment, processes and technology.

It should be noted that several of the learning outcomes identified through our factor analysis are already included in the State Board's revised version of Chapter 5. The "Basic Skills" and "Higher Order Skills" groupings, for example, have components in the "Communications" and "Mathematics" goals, while components of the "Occupational Survival Skills," "Job Search Skills," "Entrepreneurial Skills," and "Affective Job Skills" are, for the most part, present in the "Career Education and Work" goal.

We believe these findings serve as a reinforcement to the outcomes and goal areas currently proposed by the State School Board in Chapter 5 of the State School Code and provide further support for the Technical Skills Outcome we have proposed. (The

specific outcomes content of the factor groupings identified through our research is presented in Table 4).

We recognize the problem that some may feel is created with the addition of a technical skill outcome to the proposed Chapter 5 framework. After all, the outcomes described in Chapter 5, some educational policy makers might argue, are supposed to be achievable by all students in the Commonwealth. How, then, will a college prep student intending to pursue a career in medicine demonstrate a "proficiency in operating tools and equipment needed for a job?" The point may be well taken for some students. But, if this category of outcomes is not included, how, then, can we expect those students who want to enter the work force directly after high school to perform to the levels of expectations advanced in the reports mentioned at the beginning of this testimony (e.g., <u>What Work Requires of Schools; A State Prepared: Developing Pennsylvania's Work Force; etc.</u>).

We believe the problem can be resolved. One way, and we are confident there are others, would be for local school's to designate levels of attainment for outcomes as an element of their strategic plans. The proposed Chapter 5 sets a precedent for this approach. Some of the proposed outcomes are written in such a way that students are expected to demonstrate <u>that they can do</u> (e.g., "All students converse in at least one language other than English, including the native language if other than English" p.2) Other outcomes are written so that students are to demonstrate that they <u>understand how to do</u> (e.g., "All students explore the use and describe the

impact major technologies in economic and civil life" p.3). We feel the same approach could be used with technical skill outcomes. Here is how it can work.

Consider, for example, two students both interested in science and technology. The first student (a college-prep student) knows that he will be enrolling in a 4 year college program to pursue a career in chemistry after graduation from high school. The second student (a tech-prep student) knows that he will have to enter the work force after graduation, hopefully, as a chemical technician to earn tuition money so he can continue his education. The first student's entry into the work force will come at some future time, after completing more formal education that will have exposed him to the specific tools, subject matter, and technology of his profession. His high school program, therefore, would have been sufficient if he graduated with an awareness and understanding of the tools and equipment needed for a job appropriate to his or her career interest area. The second student, however, in order to find and hold a job as a chemical technician, must graduate being able to properly use the tools and equipment needed for a job. Anything less would place the student in a position of not being able to compete for employment in his or her career interest area. In this example, the aspect of the student learning outcome that addresses appropriate tools and equipment needed for a job, is met at two different levels: for the first student, at an awareness/ understanding level; for the second student, at an application level. It can be argued, therefore, that the spirit of this "career education and work outcome" was met for both students.

In closing, we strongly urge action based on the findings of our research. We seek support for the adoption of a Technical Skills Educational Outcome in order to compliment those outcomes already proposed under the Career Education and Work Goal. By doing so, we feel that the entire set of educational outcomes proposed by the Board will be enhanced and more completely serve youth in the Commonwealth. Failure to adapt the technical skills outcome may result in the development of a Code which does not reflect the views of educators or persons from business and industry as measured in our research. Further, it may not provide for the development of a skills foundation, in the form of measurable competencies, that will allow students to develop an identity with the concepts of career education or be able to project the application of technical skills developed in school to the world of work.

TABLE 4

FACTORS WITH HIGH LEVELS OF CONGRUENCY:
EDUCATION - BUSINESS & INDUSTRY

Areas of Congruency			
Business/ Industry	Education	Item No.	Factor Title and Outcome Statements
			Factor 2- Technical Skills
X	X	23.	An awareness of the special tools and equipment needed for a job.
X	X	49.	A proficiency in operating tools and equipment needed for a job.
X	X	10.	An understanding of terminology related to a job.
-	X	9.	An understanding of the principals and concepts of craftsmanship.
X	X	45.	An understanding of technical information related to a job.
X	X	43.	An understanding of the steps required to do a job.
-	X	18.	An ability to perform a job safely.
-	X	22.	An understanding of rights and duties as a worker.
-	X	30.	An ability to present a good image to an employer.
			Factor 3-Occupational Survival Skills
X	X	53.	A respect for authority.
X	X	50.	An ability to be dependable on the job.

Table 4 (Cont.)

Areas of Congruency		Item	Factor Title and
Business/ Industry	Education	No.	Outcome Statements
			Factor 3-Occupational Survival Skills (Cont.)
X	X	55.	The desire to work hard.
X	X	38.	An ability to follow directions.-X59.A positive attitude toward learning.
X	X	35.	A positive attitude toward work.
-	X	58.	A feeling of self-confidence.
X	X	60.	An understanding of employer's expectations.
X	X	54.	An ability to meet an identified standard when performing a job.
X	X	2.	An ability to be on time.
			Factor 4- Job Search Skills
X	X	44.	An ability to prepare a resume.
X	X	34.	A knowledge of how to approach an employer for potential employment.
X	X	66.	A knowledge of how to look for a job.
X	X	11.	An ability to interview effectively for a job.
X	X	63.	An ability to fill out a job application.
X	X	36.	An awareness of current andprojected job opportunities
X	X	1.	An ability to effectively communicate verbally and in writing.

Table 4 (Cont.)

Areas of Congruency		Item	Factor Title and
Business/ Industry	Education	No.	Outcome Statements
			Factor 6- Basic Skills
X	X	16.	A proficiency in applying reading skills.
X	X	39.	A proficiency in applying writing skills.
-	X	20.	A proficiency in arithmetic.
X	X	3.	A proficiency in a core of basic skills designed to prepare students for advanced study.
	X	32.	A proficiency in using a computer.
			Factor 7- Higher Order Skills
X	X	61.	A proficiency in measurement and geometry.
X	X	41.	A proficiency in basic algebra.
X	X	62.	Knowledge of basic economic principles.
X	X	28.	An understanding of basic scientific concepts and processes.
			Factor 8- Entrepreneurial Skills
X	X	12.	An understanding of risk taking and its consequences.
X	X	14.	An awareness of aesthetic criteria and concepts of design as they may be applied to decision making.
X	X	8.	An ability to work without close supervision.
X	X	13.	An ability to efficiently manage time and materials.

ENDNOTES

1. It should be noted that the wording used in the Center proposed outcome is consistent with the five common outcomes identified in the technical skill areas found in the research reported on in this testimony. It should also be noted that the wording used in the development of this outcome is consistent with one of the five competencies identified for entry into the workplace proposed in "What Work Requires of Schools - A SCANS Report for America 2000", the Secretary's Commission on Achieving Necessary Skills, US Department of Labor (1991) which states:

   Technology - Selecting equipment and tools, applying technology to specific tasks and maintaining and troubleshooting technologies.

2. Copies of two separate abstracts which describe other aspects of the educational outcomes survey research conducted by the Center have also been included as addendum items to this testimony for further reference.

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Appendix A

Transmittal Letter
and
Instrumentation
for
Business and Industry Survey

TEMPLE UNIVERSITY
A Commonwealth University

College of Education

Ritter Hall 003-00
Philadelphia, Pennsylvania 19122

Department of Curriculum, Instruction and Technology in Education (CITE)

Educational Media
Elementary Education
Secondary Education
Vocational, Adult and Continuing Education

January, 1992

Dear HRD Director or Business Owner:

Education in Pennsylvania urgently needs your help!

Please take 15 minutes to express your opinion on what the educational outcomes of Pennsylvania high schools should be by completing the attached survey.

As you may know, the State School Code is currently being revised to reflect an outcome-based set of standards to guide the delivery of education in the Commonwealth. We at the Center for Vocational Education, Temple University are conducting this statewide survey with cooperation from the Pennsylvania Employer Advisory Council to determine the opinions of the business community in Pennsylvania on this important topic.

The information that you supply on our survey will be used in strict confidence. Neither your identity nor the identity of your business will be used in our study.

A postage paid return-addressed envelope has been enclosed for your convenience. If you have any questions concerning this study, please contact me at (215) 787-6249.

Your assistance in responding to this questionnaire within the week is greatly appreciated. Your opinions as a member of the business community in Pennsylvania are valued.

Sincerely,

Chester Wichowski

Chester P. Wichowski, D.Ed.
Senior Research Associate

CPW:ct,B

File: A:Colleag.CPW

BEST COPY AVAILABLE

EDUCATIONAL OUTCOME SURVEY

Section I: BACKGROUND

Please provide the following information, by checking the appropriate space:

1. Your title or position: _____ HRD Director _____ Business Owner/CEO _____ Other: _____ (specify)

2. Type of business or service (Check only one category):

_____	Agriculture, Forestry, or Fishing	_____	Wholesale Trade
_____	Mining	_____	Retail Trade
_____	Construction	_____	Services (Health)
_____	Manufacturing (Light)	_____	Services (Educational)
_____	Manufacturing (Heavy)	_____	Services (Business/Repair)
_____	Finance, Insurance, or Real Estate	_____	Government
_____	Transportation, Communications, or Public Utilities	_____	Other: _____ (specify)

3. Number of employees:

_____	1 to 5	_____	21 to 50	_____	251 to 500
_____	6 to 10	_____	51 to 100	_____	501 and over
_____	11 to 20	_____	101 to 250		

4. Business location, by county: _____ (specify)

Section II: EDUCATIONAL OUTCOMES

The 66 statements on the following pages describe selected outcomes which students must know and/or be able to do to graduate from high school.

Please rate each statement in terms of the degree of emphasis it should receive in secondary school subjects or courses by circling your choice in the column to the left of each statement using the following scale:

DEGREE OF EMPHASIS

NONE	LITTLE	SOME	GREAT	UNCERTAIN
1	2	3	4	UN

An **EXAMPLE** outcome statement that has been rated is provided below:

Degree of Emphasis	OUTCOME STATEMENT
1 2 3 (4) UN	64. An ability to be thorough at work.

In the example above, the respondent rated the outcome statement as needing a great (4) degree of emphasis by circling Number 4.

DEGREE OF EMPHASIS

NONE	LITTLE	SOME	GREAT	UNCERTAIN
1	2	3	4	UN

Degree of Emphasis						OUTCOME STATEMENT
1	2	3	4	UN	96.	An ability to effectively communicate verbally and and in writing.
1	2	3	4	UN	32.	An ability to be on time.
1	2	3	4	UN	15.	A proficiency in a core of basic skills designed to prepare students for advanced study.
1	2	3	4	UN	67.	A positive attitude toward co-workers.
1	2	3	4	UN	39.	An awareness of the dangers of tobacco, alcohol and drugs.
1	2	3	4	UN	94.	Be able to select, manage and maintain personal and family resources.
1	2	3	4	UN	63.	An understanding of personal abilities and interests.
1	2	3	4	UN	90.	An ability to work without close supervision
1	2	3	4	UN	16.	An understanding of the principles and concepts of craftsmanship.
1	2	3	4	UN	3.	An understanding of terminology related to a job.
1	2	3	4	UN	68.	An ability to interview effectively for a job.
1	2	3	4	UN	5.	An understanding of risk taking and its consequences.
1	2	3	4	UN	44.	An ability to efficiently manage time and materials.
1	2	3	4	UN	84.	An awareness of aesthetic criteria and concepts of design as they may be applied to decision making.
1	2	3	4	UN	78.	An understanding of the influence that art and literature have on our society.
1	2	3	4	UN	13.	A proficiency in applying reading skills.
1	2	3	4	UN	53.	An ability to work as a team member.
1	2	3	4	UN	38.	An ability to perform a job safely.
1	2	3	4	UN	87.	An understanding of the need to upgrade job skills.
1	2	3	4	UN	52.	A proficiency in arithmetic.
1	2	3	4	UN	36.	A knowledge of training required for advancement in the job.
1	2	3	4	UN	8.	An understanding of rights and duties as a worker.

Comments:

DEGREE OF EMPHASIS

NONE	LITTLE	SOME	GREAT	UNCERTAIN
1	2	3	4	UN

Degree of Emphasis		OUTCOME STATEMENT
1 2 3 4 UN	12.	An awareness of the special tools and equipment needed for a job.
1 2 3 4 UN	83.	An ability to be creative and make suggestions to improve the job.
1 2 3 4 UN	21.	A positive attitude toward personal and physical health.
1 2 3 4 UN	56.	A positive attitude toward persons from different ethnic and racial backgrounds.
1 2 3 4 UN	19.	An understanding of the ecology problems facing our society.
1 2 3 4 UN	7.	An understanding of basic scientific concepts and processes.
1 2 3 4 UN	54.	An understanding of labor unions and how they affect the worker or job.
1 2 3 4 UN	57.	An ability to present a good image to an employer.
1 2 3 4 UN	2.	A proficiency in decision-making skills.
1 2 3 4 UN	82.	A proficiency in using a computer.
1 2 3 4 UN	29.	An awareness of one's personal strengths and limitations.
1 2 3 4 UN	33.	A knowledge of how to approach an employer for potential employment.
1 2 3 4 UN	91.	A positive attitude toward work.
1 2 3 4 UN	85.	An awareness of current and projected job opportunities.
1 2 3 4 UN	47.	An understanding of family life.
1 2 3 4 UN	74.	An ability to follow directions.
1 2 3 4 UN	42.	A proficiency in applying writing skills.
1 2 3 4 UN	80.	A desire to seek out job opportunities.
1 2 3 4 UN	23.	A proficiency in basic algebra.
1 2 3 4 UN	27.	An identified career goal.
1 2 3 4 UN	18.	An understanding of the steps required to do a job.
1 2 3 4 UN	25.	An ability to prepare a resume.

Comments:

DEGREE OF EMPHASIS

NONE	LITTLE	SOME	GREAT	UNCERTAIN
1	2	3	4	UN

Degree of Emphasis						OUTCOME STATEMENT
1	2	3	4	UN	17.	An understanding of technical information related to a job.
1	2	3	4	UN	93.	A proficiency in consumer decision making skills.
1	2	3	4	UN	31.	An ability to get along with a variety of people.
1	2	3	4	UN	86.	A respect for the equal rights and worth of all men and women in our society.
1	2	3	4	UN	98.	A proficiency in operating tools and equipment needed for a job.
1	2	3	4	UN	35.	An ability to be dependable on the job.
1	2	3	4	UN	4.	Knowledge of human growth and development and good nutrition.
1	2	3	4	UN	9.	Be able to use information sources and research techniques.
1	2	3	4	UN	41.	A respect for authority.
1	2	3	4	UN	55.	An ability to meet an identified standard when performing a job.
1	2	3	4	UN	43.	The desire to work hard.
1	2	3	4	UN	58.	An awareness of the participatory nature of the democratic process.
1	2	3	4	UN	34.	Positive values and attitudes toward the protection of the environment.
1	2	3	4	UN	49.	A feeling of self-confidence.
1	2	3	4	UN	51.	A positive attitude toward learning.
1	2	3	4	UN	26.	An understanding of employer's expectations.
1	2	3	4	UN	75.	A proficiency in measurement and geometry.
1	2	3	4	UN	10.	Knowledge of basic economic principles.
1	2	3	4	UN	14.	An ability to fill out a job application.
1	2	3	4	UN	99.	An understanding of the environment at the local, regional and global levels.
1	2	3	4	UN	88.	An awareness of the need for lifelong learning.
1	2	3	4	UN	65.	A knowledge of how to look for a job.

Comments:

Appendix B

Transmittal Letter and Instrumentation for

Educators Survey

TEMPLE UNIVERSITY
A Commonwealth University

College of Education

Ritter Hall 003-00
Philadelphia, Pennsylvania 19122

Department of Curriculum, Instruction and Technology in Education (CITE)

Educational Media
Elementary Education
Secondary Education
Vocational, Adult and Continuing Education

May, 1991

Dear Colleague:

The enclosed two part questionnaire has been developed by the research staff of the Center for Vocational Education, Temple University to study opinions associated with educational outcomes which students must know and/or be able to do to graduate from high school.

As you may be aware, this information is important to education in Pennsylvania as well as timely since Chapters 3, 5 and 6 of the State Code are currently under revision. As indicated by the Pennsylvania State Board of Education in the principles guiding the revision of these chapters:

> The regulations must help schools and educators focus on their instructional mission. The basis of the regulations should be student achievement of rigorous learning outcomes, not the amount of time spent in school...
>
> State regulations should facilitate a restructuring of the public schools so that all involved focus our principal efforts on establishing and achieving learning outcomes for children, based on the Goals of Quality Education, that will prepare them for successful adulthood in the twenty-first century. (P 4 - 5)

Please take some time from your schedule to complete the questionnaire within the week. The information supplied by you will be used in strict confidence. Neither your identity nor the identity of your school will be used in this study.

If you have any questions concerning this study, do not hesitate to contact me at (215) 787-6249.

Your assistance in responding to this questionnaire is greatly appreciated. Your opinions are valued.

Sincerely,

C. Wichowski

Chester P. Wichowski, D.Ed.
Senior Research Associate

CPW:ct,A

File: A:Colleag.CPW

EDUCATIONAL OUTCOME SURVEY

Section I: BACKGROUND

Check the appropriate categories regarding your background.

1. I work at: ___ an AVTS ___a Comprehensive H.S. ___ Other: _____

2. I am a: ___Teacher ___Administrator ___Counselor ___Other: _____

3. If you teach, write in your subject in the space under the appropriate field heading:

FIELD: ACADEMIC	FIELD: VOCATIONAL
_____	_____
(Write in the subject you teach.)	(Write in the subject you teach.)

Section II: EDUCATIONAL OUTCOMES

The 66 statements on the following pages describe outcomes which students must know and/or be able to do to graduate from high school. Please rate each statement in two ways.

First, rate each statement in terms of the degree of emphasis it should receive in secondary school subjects or courses by circling your choice in the column to the left of each statement using the following scale:

DEGREE OF EMPHASIS

NONE	LITTLE	SOME	GREAT	UNCERTAIN
1	2	3	4	UN

Second, review each statement and identify the course or program delivery configuration you believe is most appropriate for helping secondary students achieve the outcome by circling your choice in the column to the right of each statement using the following scale:

COURSE/PROGRAM DELIVERY CONFIGURATION

VOCATIONAL	VOCATIONAL WITH SOME ACADEMIC	EQUAL VOCATIONAL AND ACADEMIC	ACADEMIC WITH SOME VOCATIONAL	ACADEMIC
V	VA	E	AV	A

An **EXAMPLE** outcome statement that has been rated is provided below:

Degree of Emphasis	OUTCOME STATEMENT	Delivery Configuration
1 2 3 (4) UN	64. An ability to be thorough at work.	V (VA) E AV A

In the example above, the respondent rated the outcome statement as needing a great (4) degree of emphasis; the delivery configuration identified by the respondent was VA (vocational with some academic) as most appropriate for helping a student to develop the outcome.

BEST COPY AVAILABLE

DEGREE OF EMPHASIS

NONE	LITTLE	SOME	GREAT	UNCERTAIN
1	2	3	4	UN

COURSE/PROGRAM DELIVERY CONFIGURATION

VOCATIONAL	VOCATIONAL WITH SOME ACADEMIC	EQUAL VOCATIONAL AND ACADEMIC	ACADEMIC WITH SOME VOCATIONAL	ACADEMIC
V	VA	E	AV	A

Degree of Emphasis						OUTCOME STATEMENT	Delivery Configuration				
1	2	3	4	UN	96.	An ability to effectively communicate verbally and and in writing.	V	VA	E	AV	A
1	2	3	4	UN	32.	An ability to be on time.	V	VA	E	AV	A
1	2	3	4	UN	15.	A proficiency in a core of basic skills designed to prepare students for advanced study.	V	VA	E	AV	A
1	2	3	4	UN	67.	A positive attitude toward co-workers.	V	VA	E	AV	A
1	2	3	4	UN	39.	An awareness of the dangers of tobacco, alcohol and drugs.	V	VA	E	AV	A
1	2	3	4	UN	94.	Be able to select, manage and maintain personal and family resources.	V	VA	E	AV	A
1	2	3	4	UN	63.	An understanding of personal abilities and interests.	V	VA	E	AV	A
1	2	3	4	UN	90.	An ability to work without close supervision	V	VA	E	AV	A
1	2	3	4	UN	16.	An understanding of the principles and concepts of craftsmanship.	V	VA	E	AV	A
1	2	3	4	UN	3.	An understanding of terminology related to a job.	V	VA	E	AV	A
1	2	3	4	UN	68.	An ability to interview effectively for a job.	V	VA	E	AV	A
1	2	3	4	UN	5.	An understanding of risk taking and its consequences.	V	VA	E	AV	A
1	2	3	4	UN	44.	An ability to efficiently manage time and materials.	V	VA	E	AV	A
1	2	3	4	UN	84.	An awareness of aesthetic criteria and concepts of design as they may be applied to decision making.	V	VA	E	AV	A
1	2	3	4	UN	78.	An understanding of the influence that art and literature have on our society.	V	VA	E	AV	A
1	2	3	4	UN	13.	A proficiency in applying reading skills.	V	VA	E	AV	A

Comments:

DEGREE OF EMPHASIS

NONE	LITTLE	SOME	GREAT	UNCERTAIN
1	2	3	4	UN

COURSE/PROGRAM DELIVERY CONFIGURATION

VOCATIONAL	VOCATIONAL WITH SOME ACADEMIC	EQUAL VOCATIONAL AND ACADEMIC	ACADEMIC WITH SOME VOCATIONAL	ACADEMIC
V	VA	E	AV	A

Degree of Emphasis						OUTCOME STATEMENT	Delivery Configuration				
1	2	3	4	UN	53.	An ability to work as a team member.	V	VA	E	AV	A
1	2	3	4	UN	38.	An ability to perform a job safely.	V	VA	E	AV	A
1	2	3	4	UN	87.	An understanding of the need to upgrade job skills.	V	VA	E	AV	A
1	2	3	4	UN	52.	A proficiency in arithmetic.	V	VA	E	AV	A
1	2	3	4	UN	36.	A knowledge of training required for advancement in the job.	V	VA	E	AV	A
1	2	3	4	UN	8.	An understanding of rights and duties as a worker.	V	VA	E	AV	A
1	2	3	4	UN	12.	An awareness of the special tools and equipment needed for a job.	V	VA	E	AV	A
1	2	3	4	UN	83.	An ability to be creative and make suggestions to improve the job.	V	VA	E	AV	A
1	2	3	4	UN	21.	A positive attitude toward personal and physical health.	V	VA	E	AV	A
1	2	3	4	UN	56.	A positive attitude toward persons from different ethnic and racial backgrounds.	V	VA	E	AV	A
1	2	3	4	UN	19.	An understanding of the ecology problems facing our society.	V	VA	E	AV	A
1	2	3	4	UN	7.	An understanding of basic scientific concepts and processes.	V	VA	E	AV	A
1	2	3	4	UN	54.	An understanding of labor unions and how they affect the worker or job.	V	VA	E	AV	A
1	2	3	4	UN	57.	An ability to present a good image to an employer.	V	VA	E	AV	A
1	2	3	4	UN	2.	A proficiency in decision-making skills.	V	VA	E	AV	A
1	2	3	4	UN	82.	A proficiency in using a computer.	V	VA	E	AV	A

Comments:

DEGREE OF EMPHASIS

NONE	LITTLE	SOME	GREAT	UNCERTAIN
1	2	3	4	UN

COURSE/PROGRAM DELIVERY CONFIGURATION

VOCATIONAL	VOCATIONAL WITH SOME ACADEMIC	EQUAL VOCATIONAL AND ACADEMIC	ACADEMIC WITH SOME VOCATIONAL	ACADEMIC
V	VA	E	AV	A

Degree of Emphasis						OUTCOME STATEMENT	Delivery Configuration				
1	2	3	4	UN	29.	An awareness of one's personal strengths and limitations.	V	VA	E	AV	A
1	2	3	4	UN	33.	A knowledge of how to approach an employer for potential employment.	V	VA	E	AV	A
1	2	3	4	UN	91.	A positive attitude toward work.	V	VA	E	AV	A
1	2	3	4	UN	85.	An awareness of current and projected job opportunities.	V	VA	E	AV	A
1	2	3	4	UN	47.	An understanding of family life.	V	VA	E	AV	A
1	2	3	4	UN	74.	An ability to follow directions.	V	VA	E	AV	A
1	2	3	4	UN	42.	A proficiency in applying writing skills.	V	VA	E	AV	A
1	2	3	4	UN	80.	A desire to seek out job opportunities.	V	VA	E	AV	A
1	2	3	4	UN	23.	A proficiency in basic algebra.	V	VA	E	AV	A
1	2	3	4	UN	27.	An identified career goal.	V	VA	E	AV	A
1	2	3	4	UN	18.	An understanding of the steps required to do a job.	V	VA	E	AV	A
1	2	3	4	UN	25.	An ability to prepare a resume.	V	VA	E	AV	A
1	2	3	4	UN	17.	An understanding of technical information related to a job.	V	VA	E	AV	A
1	2	3	4	UN	93.	A proficiency in consumer decision making skills.	V	VA	E	AV	A
1	2	3	4	UN	31.	An ability to get along with a variety of people.	V	VA	E	AV	A
1	2	3	4	UN	86.	A respect for the equal rights and worth of all men and women in our society.	V	VA	E	AV	A
1	2	3	4	UN	98.	A proficiency in operating tools and equipment needed for a job.	V	VA	E	AV	A

Comments:

DEGREE OF EMPHASIS

NONE	LITTLE	SOME	GREAT	UNCERTAIN
1	2	3	4	UN

COURSE/PROGRAM DELIVERY CONFIGURATION

VOCATIONAL	VOCATIONAL WITH SOME ACADEMIC	EQUAL VOCATIONAL AND ACADEMIC	ACADEMIC WITH SOME VOCATIONAL	ACADEMIC
V	VA	E	AV	A

Degree of Emphasis		OUTCOME STATEMENT	Delivery Configuration
1 2 3 4 UN	35.	An ability to be dependable on the job.	V VA E AV A
1 2 3 4 UN	4.	Knowledge of human growth and development and good nutrition.	V VA E AV A
1 2 3 4 UN	9.	Be able to use information sources and research techniques.	V VA E AV A
1 2 3 4 UN	41.	A respect for authority.	V VA E AV A
1 2 3 4 UN	55.	An ability to meet an identified standard when performing a job.	V VA E AV A
1 2 3 4 UN	43.	The desire to work hard.	V VA E AV A
1 2 3 4 UN	58.	An awareness of the participatory nature of the democratic process.	V VA E AV A
1 2 3 4 UN	34.	Positive values and attitudes toward the protection of the environment.	V VA E AV A
1 2 3 4 UN	49.	A feeling of self-confidence.	V VA E AV A
1 2 3 4 UN	51.	A positive attitude toward learning.	V VA E AV A
1 2 3 4 UN	26.	An understanding of employer's expectations.	V VA E AV A
1 2 3 4 UN	75.	A proficiency in measurement and geometry.	V VA E AV A
1 2 3 4 UN	10.	Knowledge of basic economic principles.	V VA E AV A
1 2 3 4 UN	14.	An ability to fill out a job application.	V VA E AV A
1 2 3 4 UN	99.	An understanding of the environment at the local, regional and global levels.	V VA E AV A
1 2 3 4 UN	88.	An awareness of the need for lifelong learning.	V VA E AV A
1 2 3 4 UN	65.	A knowledge of how to look for a job.	V VA E AV A

Comments: